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Small Business Sector Study
Impacts of Environmental Regulations on Small Business

Clark (Lyman H.), Washington, DC

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Lyman H. Clark and E.H. Pechan & Associates, Inc.

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Lyman H. Clark
Washington, D.C.
and E.H. Pechan Associates
Springfield, VA

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16. Abstract (Limit: 200 words)

The EPA Administrator requested that his staff conduct analyses of the costs of environmental controls across different sectors of the economy, one of them being small businesses. The Administrator's request arose from the concern that EPA's regulatory review process generally focuses on one regulation at a time. When examined individually, the impact of each regulation may be small,, but the cumulative impacts may impose excessive economic burdens upon small business. As this was the first attempt by EPA to examine the cumulative effects of projected regulations on small businesses, some of which are in the early stages of development, the findings of the study are best considered as preliminary.

The small business study focused on nine industries likely to be adversely affected by the regulations. The study found that the costs may be high for small businesses in three of the industries - electroplating, wood preserving, and pesticide formulating. If the costs for hazardous waste and toxic chemical controls prove to be as high as estimated and cannot be passed on to consumers, some small businesses in these industries may be forced to discontinue operations or to close. Some small dry cleaners that have underground storage tanks or require substantial perchlorethylene emissions controls may have difficulty meeting the requirements. Gas stations, trucking firms, and farm supply stores with leaking underground storage tanks may have difficulty.

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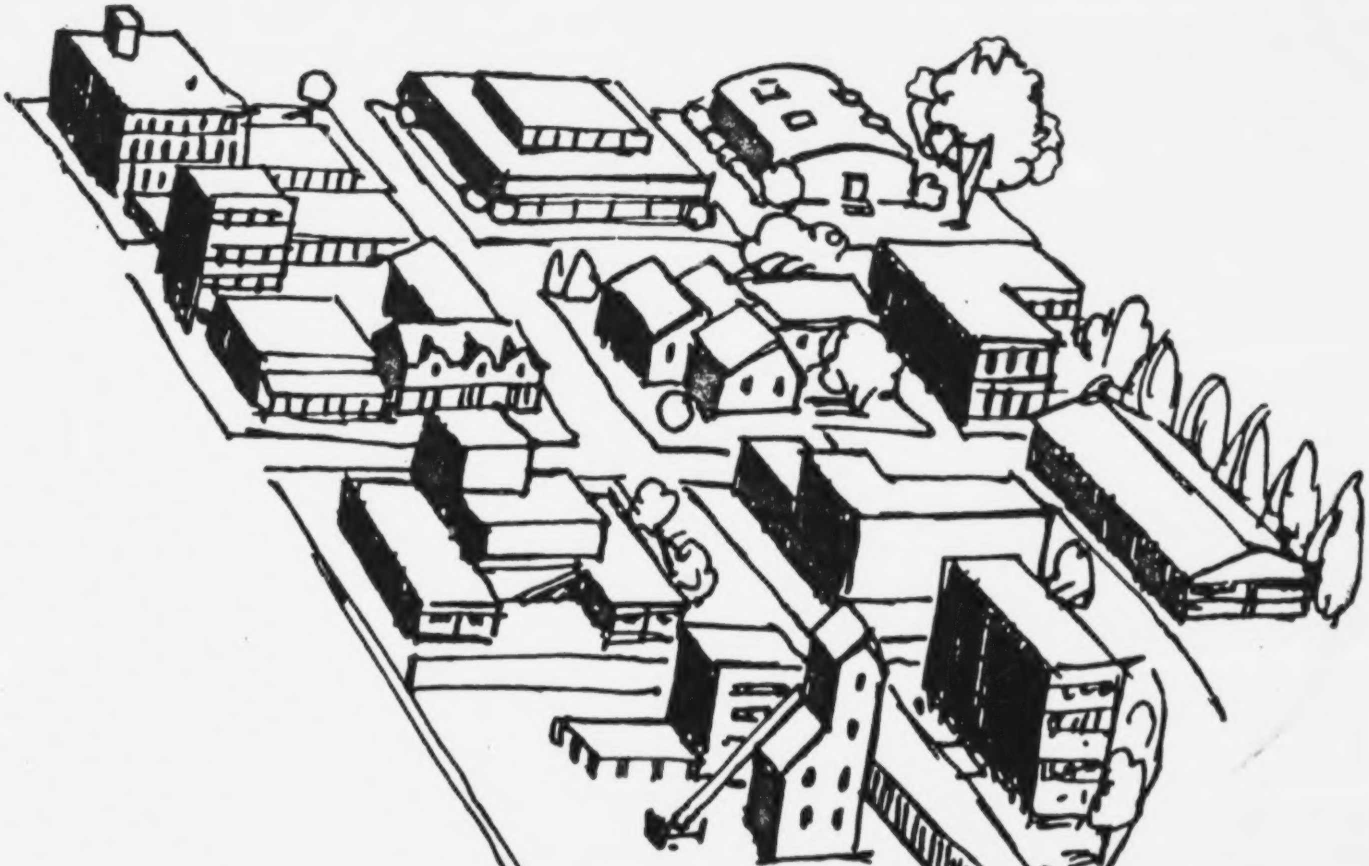

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THE SMALL BUSINESS SECTOR STUDY:
IMPACTS OF ENVIRONMENTAL REGULATIONS
ON SMALL BUSINESS

Prepared for

Economic Studies Branch
Office of Policy Analysis
Office of Policy, Planning and Evaluation
U.S. Environmental Protection Agency

By

Lyman H. Clark
Washington, D.C.

and

E. H. Pechan & Associates, Inc.
Springfield, Virginia

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Allen Basala (Air)
Allen Jennings (Pesticides)
Karen Klima (Surface Water)
A. W. Marks (Drinking Water)
Elizabeth LaPointe (Solid Waste)
Michael Shapiro (Toxic Substances)
Ralph Luken (Policy) (Chair)

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THE IMPACT OF ENVIRONMENTAL REGULATIONS UPON SMALL BUSINESSES

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Chapter 1

INTRODUCTION

The United States is a nation of small businesses as much as it is a nation of large corporations. Over ninety-five percent of all businesses have fewer than 50 employees. Although these firms employ only about one quarter of the people in the United States and account for about one quarter of total sales, they are an important part of the economy and an integral part of the American way of life.

Environmental regulations affect all businesses, large and small, but small businesses have their own special problems in dealing with environmental regulations. Firms with only 5 or 10 employees do not have legal and engineering staffs to assist them, nor to they have the financial resources available to larger firms. Often their costs per unit of production to comply with environmental regulations are much larger than those of their large competitors.

From its inception in 1970, the U.S. Environmental Protection Agency (EPA) has recognized the special problems of small businesses in dealing with environmental regulations and has taken these problems into account in its rulemaking process. Often, EPA has relaxed environmental regulations for small businesses and, for some regulations, EPA has exempted small businesses. This study is part of EPA's continuing effort to investigate the impact of its regulations on small businesses.

PURPOSE OF THE STUDY

This study investigates the potential impact upon small businesses of the environmental regulations that will become effective during the five year period 1988 through 1992. The investigation first examines how these regulations may affect small businesses in general, and then examines in more detail the impacts upon selected industries. The final chapter summarizes the findings and highlights some potential problem areas.

This study is not meant to be either detailed or rigorous. Rather, it is intended to take a first look at a complex subject and to identify potential problem areas. The study covers 85 recent and forthcoming environmental regulations and examines the potential impacts of these regulations on small businesses in nine separate industries. To cover this subject in rigorous detail would require extensive resources and considerable time. EPA has chosen to undertake this initial study in order to gain a quick, broad-brush picture of the potential regulatory impacts and to obtain insights into areas where it might more effectively direct its resources in the future.

STUDY METHODOLOGY

This study first examines small businesses in general to shed some light on their relative importance in the economy and in the various industries. It then looks at the list of 85 recent and forthcoming environmental regulations (see Appendix J) to determine which industries are likely to be affected most. The study then focuses on nine of these industries. The industries were selected to include those that are dominated by small businesses as well as those that have a variety of environmental problems.

The approach used in analyzing each of these industries selected may be outlined as follows:

1. Describe a typical small business in the industry;
2. Identify the environmental problems associated with small businesses in the industry;
3. Identify the environmental regulations that will apply to these small businesses and estimate the associated compliance costs;
4. Estimate the paperwork costs associated with the environmental requirements for each industry.
5. Compare the estimated compliance costs, including the paperwork burden, with industry financial statistics to determine whether small businesses might be expected to have difficulty meeting environmental requirements. Where the estimated annual cost of compliance was found to exceed 30% of net profits and/or where the estimated capital costs were found to exceed 30% of equity, then small businesses in the industry were identified as having the potential for financial difficulties.

The threshold value of 30% was selected on more or less an arbitrary basis. Time and data limitations prevented any extensive financial modeling or detailed analysis of potential business impacts. This study was designed, instead, to identify potential problem areas. When estimated environmental costs exceed 30% of the median small business's annual net profits and/or estimated capital costs exceed 30% of the median equity, then there seems to be cause for concern. Small businesses in some industries may be able to pass such costs on to their customers and others may be able to reduce the costs through innovative techniques. Some of the costs will be absorbed by reduced taxes. There are a variety of ways that businesses may adjust to increased costs. Nevertheless, when it appears that increased costs in any size category of any industry may exceed 30% of profits, it is safe to say that the potential for financial difficulties exists. Because the study examined the financial statistics of both the median firm in each size category and the firm at the lowest quartile level, the results of the analysis are not particularly sensitive to the 30% threshold value. When costs were close to 30% for the median firm, they were well in excess of 30% for the firm at the lowest quartile.

This study did not address the issue of whether small businesses will be able to pass increased environmental costs on to their customers in the form of higher prices. While economic theory suggests that prices in an industry should rise to reflect the average costs of producers, such adjustments may take time and may be inhibited by competition from substitute or imported products or simply by consumer resistance. Furthermore, the increased costs experienced by small businesses may be greater than industry averages. Predicting the price increases that might result from increased environmental costs is a complex exercise that is beyond the scope of this study.

Exceptions to the general methodology were made for two industries: gasoline service stations and private water supply systems. The analysis of gasoline service stations was based upon a financial model developed for EPA's Office of Underground Storage Tanks. The analysis of private water supply systems was provided by EPA's Office of Drinking Water based upon its surveys of water supply systems.

For information on the financial condition of small businesses, this study used the 1976-1983 Fin/Stat file compiled by the U.S. Small Business Administration. This is the only data base that provides separate statistics for the smallest size categories of businesses by four-digit SIC codes. Because the estimates of environmental costs often were available only for an "average" small business, it was not possible to conduct detailed financial analyses on businesses of each size category. Using the Fin/Stat file made it possible, however, to examine the financial capabilities of firms of different sizes of businesses and to identify potential problem areas.

Although 1976-1983 financial data are slightly outdated, inflation from 1983 to the end of 1987 was relatively low, about 16%. This is well within the range of accuracy of the other data used in the study and within the normal year-to-year fluctuations in the Fin/Stat data. The median dry cleaner in the Fin/Stat file had lower net profits in 1983 ($12,000) than in 1977 ($14,900), for example, even though the inflation over that period was almost 65%. The appendices present summaries of the 1983 financial statistics for the median small businesses in most of the industries. For a few industries, the average data for 1976-1983 appears to be more representative, however, and is presented instead.

LIMITATIONS

The approach used in this study has several limitations. For example:

1. Many of the regulations included in the study are not yet final. One of the environmental regulations affecting electroplaters -- for example, the hexavalent chromium air emission standard -- is not available yet in even a preliminary form, and one of the regulations affecting dry cleaners -- the perchloroethylene air emission standard-- is still under formulation with many options under study. Thus, the eventual costs and impacts of many regulations may vary considerably from those indicated herein.

2. The performances of individual small businesses differ considerably from industry averages. Although this study attempts to take this into account in a qualitative way, the study cannot go so far as to say how many small businesses might experience difficulties in any industry.

3. The data used in the study, including both the estimates of environmental costs and the business financial statistics, are of limited accuracy. Thus, the conclusions must be regarded as preliminary.

In spite of these limitations, the study describes how environmental regulations will affect small businesses, provides estimates of how environmental costs compare with the financial resources of small businesses, and identifies many potential problem areas for further study.

Chapter 2

ENVIRONMENTAL REGULATIONS AND SMALL BUSINESS

EPA's list of regulations that may affect small businesses during the 1988-1992 period includes 85 different regulations. Although it might seem that so many regulations would overwhelm any small business, the actual impact could be much less. Many small businesses will not be affected adversely by any of the 85 environmental regulations. Others will be affected significantly by one or two regulations, and some will be affected by many regulations. At the same time, many small firms, particularly those that provide pollution control products or services, will find that their businesses grow as a result of the forthcoming environmental regulations. Thus, the overall impact of EPA's recent and forthcoming regulations is by no means self-evident.

This chapter examines the overall impact of these environmental regulations upon small businesses during the period 1988-1992. The chapter first describes the small business community, then examines which of the environmental regulations will affect small businesses, and finally comments upon the positive and negative impacts of the regulations upon the small business community.

SMALL BUSINESS IN THE UNITED STATES

In 1986, there were almost 4 million businesses in the Unites States. These businesses employed almost 90 million people. Table 2-1 presents statistics on the number of U.S. businesses in 1986 by employment size category. From this, it is evident that most businesses (53 percent) in the Unites States are very small, with fewer than five employees. Almost 90 percent of the businesses have fewer than 20 employees and 99 percent have fewer than 250 employees. Although over half of the businesses in the United States employ one to four people, only 5.1 percent of the people in the Unites States work for such businesses. Only 18 percent of the people work for firms with fewer than 20 employees.

Definitions of a "small business" vary. The U.S. Small Business Administration (SBA) uses different definitions for each industrial category. For most manufacturing industries, SBA defines a small business as a firm with fewer than 500 employees (99.6% of all firms). The U.S. Occupational Safety and Health Administration (OSHA), on the other hand, defines a small business as a firm with fewer than 10 employees (75% of all firms). Most of the statistics presented in this segment of the Sector Study focus on businesses with fewer than 50 employees (95.1% of all firms). While this definition is somewhat arbitrary, it in no way affects the conclusions of the study. Whatever the definition used, most businesses are small and the number of small businesses is about 3.5 million.

Table 2-1

BUSINESSES IN THE UNITED STATES BY SIZE - 1984

Size of Firm (employees)	Number of Firms	Percent of Total		
		Number	Employment	Sales
1-4	1,959,642	52.8%	5.5%	4.8%
5-9	839,268	22.6%	6.1%	5.6%
10-19	453,080	12.2%	6.6%	6.3%
20-49	286,449	7.7%	9.3%	8.4%
50-99	92,979	2.5%	6.8%	5.9%
100-249	50,723	1.4%	8.2%	6.7%
250-499	15,220	0.4%	5.7%	4.4%
500-999	6,732	0.2%	5.1%	3.7%
1,000-4,999	5,553	0.1%	12.2%	12.2%
5,000-9,999	691	0.02%	5.3%	6.3%
≥10,000	719	0.02%	29.2%	35.8%
Total	3,711,056			

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

Table 2-2

SMALL BUSINESSES* IN THE UNITED STATES BY SECTOR - 1984

Sector	Number of Small Businesses	Percent of Sector Total		
		Number	Employment	Sales
Agriculture	95,257	98%	59%	67%
Mining	32,843	94%	12%	5%
Construction	498,610	98%	58%	55%
Manufacturing	309,540	88%	12%	10%
Transportation	123,072	94%	18%	11%
Wholesale Trade	400,932	97%	54%	49%
Retail Trade	1,022,150	97%	42%	39%
Finance	247,778	95%	23%	17%
Services	808,263	94%	27%	31%
TOTAL	3,538,445			

* Includes businesses with 1-49 employees.

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

Although firms with fewer than 50 employees account for about 90%-95% of the firms in all sectors of the economy, the relative importance of small businesses varies from sector to sector. Firms with fewer than 50 employees account for over half the employment and sales in some sectors - agriculture, construction, and wholesale trade - but less than 20 percent of employment and sales in other sectors - mining, manufacturing, and transportation. Thus, some sectors of the economy can be said to be "small business dominated" and others can be said to be "large business dominated." The differences in relative dominance are even more dramatic at the level of individual industries, as is discussed further below.

The financial resources available to small businesses for complying with environmental regulations are, of course, much more limited than those available to larger companies. As shown in Table 2-3, the average (median) business in the manufacturing sector with 1-9 employees had net profits in 1983 of $11,000 and equity of $62,000. The difference between these very small firms and those just slightly larger is substantial. Businesses with 20 to 49 employees averaged $44,000 in net profits in 1983 and had equity of $367,000. Thus, even within the range of businesses that would ordinarily be considered small, there can be dramatic differences in financial capabilities.

ENVIRONMENTAL REGULATIONS AND SMALL BUSINESS

Most environmental regulations address a single environmental problem, and often this problem is specific to a single industry or product or a small group of industries or products. Thus, most environmental regulations apply to only a small portion of the business community. Most of EPA's regulations are directed at reducing residuals; that is, at reducing the emissions of contaminants into the air, water, or soil. These are the air and water standards and solid waste regulations that are most often associated with environmental regulation. EPA issues another type of regulation, however, governing the contents or sale and use of certain products. These product regulations most often concern toxic and hazardous substances, such as pesticides. For some businesses, EPA's product regulations can be more important than those governing residuals.

Whether a small business is affected by many environmental regulations, only one regulation, or none at all depends upon whether the business contributes to environmental problems or helps to solve them. Most small businesses - for example, those in the wholesale, retail, financial, and services sectors - are relatively neutral as regards environmental problems and, hence, are not directly affected by any environmental regulations.

Small businesses are adversely affected by environmental regulations when they create environmental problems that the nation has decided to address. Traditionally, the businesses associated with environmental problems have been those in the "smokestack" industries, such as mining and manufacturing -- industries that discharge pollutants into the air or waterways. More recently, environmental regulations have focussed upon the risks associated with toxic chemicals and hazardous wastes. The businesses adversely affected by these new regulations are those that use toxic chemicals in their processes and/or generate hazardous wastes.

Table 2-3

FINANCIAL PROFILES - 1983
(median values in $1,000)

MANUFACTURING
(SIC 20-39)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$257	$726	$1,600	$3,709	$11,208	$1,076
Expenses & Taxes	247	704	1,556	3,629	10,958	1,038
Net Profit	11	22	44	81	250	28
Assets	134	351	775	1,900	5,975	534
Equity	62	156	367	823	2,645	239
Return on Equity	17%	14%	12%	10%	9%	12%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Small businesses are positively affected by environmental regulations, if they engage in activities that help solve environmental problems. Small businesses that provide engineering or laboratory services, manufacture pollution control or monitoring equipment, or clean up hazardous waste sites, for example, find that environmental regulations help their businesses grow. One small business' expenditure to comply with an environmental regulation is often another small business' receipt. Thus, when the nation decides to solve environmental problems, the small businesses that provide the solutions prosper.

The list of 85 environmental regulations, therefore, will present problems for some small businesses and opportunities for others. Table 2-4 lists the industries that could be either negatively or positively affected by EPA's regulations. While this list is not exhaustive, it includes those industries that appear to be most significantly affected by each regulation.*

The industries that appear most often in the negatively affected column of Table 2-4 are those with environmental problems that are the focus of EPA's current regulatory activity. In the decade of the 1970s, environmental regulations focused upon reducing air pollutant emissions and cleaning up wastewater discharges. The industries most negatively affected by environmental regulations in the 1970s were the "smokestack" industries, those that emitted conventional air pollutants and discharged contaminated wastewaters. Now in the 1980s, most of these air and water pollution regulations are in place and the focus of environmental regulations has expanded to include toxic substances and hazardous wastes. For this reason, most of the negatively impacted industries in Table 2-4 are those that handle toxic or hazardous substances and/or produce hazardous wastes. These include some industries that usually are considered to be polluting industries - for example, petroleum refiners, iron foundries, and electric utilities - and other industries that generally are not regarded as polluters - for example, dry cleaners, photofinishing laboratories, gasoline service stations, and farm supply stores.

In the positively affected columns of Table 2-4 are most of the industries that provide environmental services and pollution control equipment including consulting companies, engineering firms, equipment manufacturers, construction contractors, and chemical laboratories. In many cases, the small businesses that will benefit from the environmental regulations are highly specialized; for example, manufacturers of underground storage tank monitoring equipment. In some cases, however, the positively affected column includes industries that are more general and are not usually associated with pollution control services. Home improvement contractors, for example, will experience an increase in business as houses are modified to reduce radon contamination.

Some industries appear in both columns of Table 2-4. These are industries that provide environmental services and encounter environmental problems as a result of their activities. The most notable examples are the companies that provide hazardous waste treatment and disposal services. These companies will experience an increase

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*It must be emphasized that this list of industries has been prepared using information that, in many cases, is still preliminary. As the particulars of each environmental regulation are developed, it is possible that different industries will be included and/or that the estimated magnitude of effects will be changed.

Table 2-4

INDUSTRIES POTENTIALLY AFFECTED BY ENVIRONMENTAL REGULATIONS

Program/Regulation	Industries that may be Adversely Affected	Industries that may be Positively Affected
AIR		
1 Rural Fugitive Dust	Undetermined	Undetermined
2 Stratospheric Ozone	Foam blowing	Companies providing replacement products; engineering services
3 Municipal Waste Combustors	Refuse systems	Engineering; equip. manufacturing
4 TSDF Air Standards	Refuse systems; commercial recyclers; oils, lubricating and refining	Valves and pipe fittings; pumps
5 Diesel Fuel Standards	Refineries, petroleum; engines, diesel, semi-diesel and dual fuel, except aircraft	Engineering; equip. manufacturing
6 Diesel Particulate Standards	Gas/diesel engines; truck and bus bodies	Motor vehicle parts, machinery
7 Fuel Volatility	Refineries, petroleum	
8 Gas Marketing	Motor vehicle, truck and bus manufacturers; gasoline stations	Motor vehicle parts, hardware
9 Lead Phasedown	N/A - proposal shelved indefinitely	
10 NAAQS: Lead	Lead smelters; battery manufacturers	Substitutes for lead
11 NAAQS: Particulate Matter	Crushed/broken limestone; other crushed/broken stone; construction sand and gravel; hydraulic cement; cut stone and stone products; ground/treated minerals; wholesale grain; utilities; iron/steel; petroleum; grain mills; paper mills; paving mixtures; lime; gray iron foundries; copper; lead; aluminum; steam supply; municipal paved roads	Engineering services; pollution control equip.
12 NESHAP: Chromium	Electroplating	Engineering services; pollution control equip.; machine manufacturing
13 NESHAP: Perc Dry Cleaning	Dry cleaners and laundromats	Pollution control equipment, machine manufacturing
14 NSPS: Small Boilers	Commercial and institutional establishments; boiler manufacturing; wood preserving	Engineering services; pollution control equip.; boiler manufacturing
15 NSPS: Industrial Boilers	Manufacturing industries	Engineering services; pollution control equip.; boiler manufacturing
16 NSPS: Woodstove	Wood heater manufacturers, some homeowners, hardware and retail stores selling heaters	Engineering - certification requirements

Table 2-4

INDUSTRIES POTENTIALLY AFFECTED BY ENVIRONMENTAL REGULATIONS

Program/Regulation	Industries that may be Adversely Affected	Industries that may be Positively Affected
RADIATION		
17 Radon	Real estate	Construction
18 Radiofrequency Guidance	Radio/TV broadcasting	Engineering; equipment repair
19 Low Level Radioactive Waste	Refuse systems	Research institutions (nuclear accelerators)*, educational facilities*, refuse systems
20 High Level Radioactive Waste	Commercial electrical power generators; national defense	Disposal services
PESTICIDES		
21 Inerts	Chemicals and pesticides	Toxicology labs (if used)
22 Farmworkers	Pesticides and agricultural chemicals; disinfecting and exterminating; farm supply stores; nurseries; greenhouses; forestry	Disinfecting and exterminating; chemical labs; makers of protective clothing
23 Pesticides in Groundwater	Pesticides and agricultural chemicals; pest control; farm supply stores: commercial applicators	Disinfecting and exterminating
24 Large Volume Pesticides	Pest control; pesticides and agricultural chemicals: commercial applicators	Pesticides and agricultural chemicals (for replacement products)
25 Data Requirements	No additional impact (requirements covered by existing regulations)	None
26 Reregistration of Pesticides	Disinfecting and exterminating	Disinfecting and exterminating (possibly)
TOXIC SUBSTANCES		
27 Asbestos Ban and Phasedown	Manufacturers using asbestos	Manufacturers using substitutes
28 Asbestos in Schools	All local education agencies	Construction
29 Chlorinated Solvents	Dry cleaners; metal cleaning (gas stations, repair/maintenance); paint stripping; aerosols	Equipment manufacturing, Manufacturers of substitutes
30 PCBs: Electical Equipment	Electric services	Electric services
31 PCBs: Electrical Transformers	Power, distribution and speciality transformers; electric services	Electric services
32 Premanufacture Review Program	Chemicals and allied products, agricultural chemicals	Toxicology labs (if used)

* Cost savings would be realized since wastes whose level of radioactivity is "Below Regulatory Concern" could be disposed of as a non-radioactive waste

Table 2-4

INDUSTRIES POTENTIALLY AFFECTED BY ENVIRONMENTAL REGULATIONS

Program/Regulation	Industries that may be Adversely Affected	Industries that may be Positively Affected
SARA		
33 Title III of SARA	Industries that handle toxic chemicals	Consultants; laboratories
RCRA		
34 Subtitle C Location Standards	Businesses that generate haz. waste	Refuse systems
35 Subtitle D Criteria	Refuse systems; landfills; businesses that use waste disposal services	Refuse Systems
36 Liner and Leachate Collection	Refuse systems; landfills; businesses that use waste disposal services	Refuse systems
37 Corrective Action at SWMU	All businesses and industries generating hazardous waste	Refuse systems; inspection services
38 Hazardous Waste Burning	Chemical industries; metals	Equipment manufacturing; monitoring and inspection services
39 Municipal Ash	Refuse systems	Refuse systems
40 Land Ban - First Thirds	All businesses and industries that generate haz. waste; refuse systems	Refuse systems
41 Land Ban - Soil and Debris	Refuse systems	Refuse systems
42 Land Ban - Dioxin	Gum and wood chemicals; refuse systems	Refuse systems
43 Land Ban - Cal. List	Chemicals; wood preserving	Refuse systems
44 UST Financial Responsibility	Petroleum industries; gasoline service stations; dry cleaners; and other businesses that store petroleum in underground storage tanks	Insurance companies
45 UST Technical Standards	Petroleum industries; gasoline service stations; dry cleaners; and other businesses that store petroleum in underground storage tanks	Equipment manufacturing, repair
46 Hazardous Waste Tank Standards	Businesses generating hazardous solid waste	Refuse systems; inspection services
47 Toxicity Characteristic	Businesses generating haz. wastes	Chemical industry
48 Small Quantity Generator	Businesses generating 100-1000kg/mo. of hazardous waste	Refuse systems
49 Waste Oil Management	Re-refiners of used oil; collectors of used oil; gasoline service stations; trucking companies	Construction; monitoring equipment manufacturers; underground storage tank manufacturers
CERCLA		
50 National Contingency Plan	Responsible parties; Fund; States; Federal agencies	Hazardous waste disposal and cleanup
51 CERCLA Settlement Policy	N/A - reduces transaction costs	All businesses; small businesses, in particular, because of "de minimus component"

Table 2-4

INDUSTRIES POTENTIALLY AFFECTED BY ENVIRONMENTAL REGULATIONS

Program/Regulation	Industries that may be Adversely Affected	Industries that may be Positively Affected
DRINKING WATER		
52 Total Coliform Rule	Water supply systems	Equip. repair, monitoring services
53 Surface Water Treatment-Filtration	Water supply systems	Filtration, disinfection equipment manufacturing; monitoring equipment
54 VOCs in Drinking Water	Water supply systems	Removal equipment; monitoring equip.
55 SOCs in Drinking Water	Water Supply systems	Removal equipment; monitoring equip.
56 Inorganics in Drinking Water	Water Supply systems	Removal equipment; monitoring equip.
57 Fluoride in Drinking Water	Water supply systems	Removal equipment; monitoring equip.
58 Lead MCL and Corrosion Control	Water supply systems	Removal equipment; monitoring equip.
59 Lead Ban	Water supply systems; home building; plumbing	Plumbing equipment and services
60 34 MCLs	Water supply systems	Monitoring equipment (if required)**
61 Radionuclides	Water supply systems	Removal equipment; monitoring equip.
62 Disinfection	Water supply systems	Removal equipment; monitoring equip.
63 Public Notification Rule	Water supply systems	Postal service; newspapers
GROUND WATER		
64 Well-head Protection	All hazardous waste facilities; all possible sources of contaminants (dry cleaning, photofinishing; electroplating; wood preserving; industries using solvents, such as computer chip manufacturing; petroleum bulk transfer; salt storage yards, junkyards, railyards;; pesticide transfer to applicator vehicles)	Hydrogeologic information services; land use planning; education and training; moving companies
65 Class I Underground Injection Wells Part 122 - Part 146 CFR	Chemical, petrochemical and large manufacturing companies	Hydrogeologic engineering services
66 Class II Underground Injection Wells	Chemical, petrochemical and large manufacturing companies	[Specific amendments for design, construction, and operation not yet identified.]
67 Class V Underground Injection Wells Report to Congress: Class V Injection Wells (submitted 9/30/87)	Industrial drainage wells; electric power re-injection wells	[Regulatory options have not been proposed.]

** No exceedence of the 34 MCLs expected.

Table 2-4

INDUSTRIES POTENTIALLY AFFECTED BY ENVIRONMENTAL REGULATIONS

Program/Regulation	Industries that may be Adversely Affected	Industries that may be Positively Affected
MUNICIPAL		
68 Construction Grants Program	Municipalities, states	Municipalities, states, construction
69 Secondary Treatment Waivers	Industries discharging toxic pollutants to municipal treatment plants	Sewage treatment works
70 Municipal Sewage Sludge	Industrial users of municipal wastewater treatment plants	Waste management; laboratories
71 State Sludge Management	Industrial users of municipal wastewater treatment plants	Waste management; laboratories
72 Pretreatment	Industrial users of municipal wastewater treatment plants	Waste management; laboratories
73 Stormwater	Municipalities	Control equipment; engineering services
74 Non-Point Sources	Farming (but no impact during 5-year study period)	N/A
SURFACE WATER		
75 Wetlands	Construction; real estate developers	Disposal services; environmental services (for environmental impact studies)
76 National Estuary Program	Marinas; boat yards; industries discharging pollutants; industries requiring large quantities of fresh water	Disposal services; removal equip.; monitoring equipment
77 Toxic Water Pollutants	Possibly all discharging industries	Removal equip. or engineering service
78 Ocean Dumping	Municipal sewerage authorities; industrial ocean dumpers	Removal equipment; land incineration
79 ELG: Foundries	Metal manufacturing, primarily iron	Equipment repair; engineering services; equip. manufacturing
80 ELG: Placer Gold Mining	Placer gold mining	Equipment repair; engineering services; equip. manufacturing
81 ELG: Machinery Manufacturing and Rebuilding	Machinery, primarily automotive, aircraft; trucking, railroads	Equipment repair; engineering services; equip. manufacturing
82 ELG: Oil and Gas	Oil and gas industries	Equipment repair; engineering services; equip. manufacturing
83 ELG: Organic Chemicals	Chemical manufacturing	Equipment repair; engineering services; equip. manufacturing
84 ELG: Pesticides	Pesticides; pesticide formulators	Equipment repair; engineering services; equip. manufacturing
85 ELG: Pulp and Paper	Pulp and paper mills	Equipment repair; engineering services; equip. manufacturing

in business as the nation devotes more of its resources to dealing with its hazardous waste problems. The same companies, however, will be faced with increasingly stringent standards governing the treatment and disposal of hazardous wastes. They will have to make significant expenditures to comply with the new regulations. Furthermore, increased costs associated with hazardous waste will induce companies to reduce the amount of hazardous waste they generate. This will, in turn, contribute to an eventual decline in business for the hazardous waste treatment and disposal companies. The net effect of new environmental regulations on these companies in the long run is impossible to predict.

SUMMARY

This chapter has identified a number of industries that will be affected either positively or adversely affected by EPA's regulations and, by omission, those industries that will not be affected directly by the regulations. The industries listed most frequently in Table 2-4 are summarized in Table 2-5. Most of the industries in Table 2-5 are in the manufacturing sector, with the exception of a few service industries, such as dry cleaning or gasoline service stations, that use toxic chemicals or hazardous substances. Most small businesses are in industries that will not be affected directly by any of the environmental regulations. These include most of the small businesses in wholesale trade, retail trade, finance, and services -- sectors that include 70% of all small businesses. Some small businesses, such as engineering and consulting companies, are in industries that will be positively affected by the environmental regulations and some are in industries that will be adversely affected. Table 2-6 examines the small business composition of those industries most often listed in Table 2-4 as being adversely affected by the environmental regulations. These industries include approximately 120,000 small businesses, or about 3.2% of the small businesses in the United States.

Because EPA is particularly concerned about those small businesses that may be overburdened by environmental regulations, the next chapter focuses upon identifying the industries in which many small businesses will be adversely affected by the regulations and describing the impact of the regulations upon typical small businesses in a number of those industries.

Table 2-5

INDUSTRIES POTENTIALLY AFFECTED BY ENVIRONMENTAL REGULATIONS

SUMMARY

Industries That May Be Adversely Affected

Asbestos
Chemicals
Construction*
Dry Cleaning
Electric Equipment*
Electric Utilities
Electroplating
Farm Supply Stores
Gasoline Service Stations
Motor Vehicles
Motor Vehicle Parts*
Pest Control
Pesticides and Agricultural Chemicals
Petroleum Refining
Photofinishing
Pulp and Paper
Radio/TV Broadcasting
Real Estate
Refuse Systems*
Trucking
Water Supply Systems
Wood Heater Manufacturers
Wood Preserving

All Industries with Hazardous Wastes

Manufacturing and Transportation Industries that Handle Toxic Chemicals

Industries That May Be Positively Affected

Chemical Laboratories
Construction*
Consulting
Electric Equipment*
Engineering
Equipment Manufacturing
Insurance
Machinery
Motor Vehicle Parts*
Plumbing and Pipe Fitting
Refuse Systems*

* Industries that may be affected both positively and adversely.

Table 2-6

SMALL BUSINESSES* IN SELECTED INDUSTRIES - 1984

SIC	Industry	Number of Firms	Number of Small Businesses	Small Business Portion of		
				Firms	Employment	Sales
2491	Wood Preserving	344	309	90%	49%	54%
2861	Gum & Wood Chemicals	70	61	87%	4%	18%
2879	Pesticide Formulators	338	307	91%	13%	14%
2911	Petroleum Refining	315	241	77%	1%	5%
3292	Asbestos Products	114	91	80%	4%	3%
3321	Gray Iron Foundries	602	370	62%	10%	11%
3341	Secondary Smelting	506	435	86%	25%	25%
3471	Electroplating	3,350	3,050	91%	56%	51%
4213	Interstate Trucking	24,608	22,656	92%	27%	30%
4911	Electric Utilities	1,376	864	62%	4%	4%
4941	Water Supply	2,109	1,977	94%	32%	28%
4953	Refuse Systems	2,868	2,742	96%	31%	30%
5191	Farm Supply Stores	15,810	15,609	99%	66%	65%
5541	Service Stations	54,930	54,077	98%	71%	62%
7216	Dry Cleaners	15,728	15,438	98%	79%	79%
7395	Photofinishing Labs	4,739	4,547	96%	42%	47%

* Includes businesses with 1-49 employees.

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

Chapter 3

IMPACT UPON SELECTED INDUSTRIES

Of most interest to EPA in this study are those small businesses that may find it difficult to meet the requirements of environmental regulations. Accordingly, this chapter focuses on a few industries that are representative of those in which such difficulties might be expected.

Table 2-6 has identified those industries most likely to be adversely affected by environmental regulations during the 1988-1992 period. While this list certainly is not exhaustive, it probably is representative. It includes many different types of industries and industries with many different environmental problems. Several of the industries listed are of interest to this study because they clearly are small business dominated: dry cleaning, gasoline service stations, farm supply stores, electroplating, wood preserving, and photofinishing laboratories. Although small businesses do not account for a high portion of sales in the interstate trucking industry, the industry also is of interest simply because it includes such a large number of small businesses. Other industries, such as pesticide formulators and water supply companies, are of interest because their environmental problems are different from most of the other industries on the list. These are the "representative" industries selected for further study in this chapter.

Table 3-1 identifies the environmental regulations that will adversely affect each of these industries. The regulations that will have a direct impact are designated with a "D," those with an indirect impact with an "i," and those with an impact that is still uncertain with a "?." As can be seen, even those industries selected as being representative of those most heavily affected by environmental regulations are subject to relatively few regulations. Small water supply companies will be affected directly by several drinking water regulations, but small businesses in the other selected industries will be affected directly by only a few regulations.

The following sections are devoted to summarizing the environmental problems of and the impact of EPA's regulations upon small businesses in the selected industries. Presented in the Appendix are more lengthy discussions of each of the selected industries.

ELECTROPLATING

The electroplating process requires the use of many toxic and hazardous materials, such as metals and solvents. Although electroplaters generally reclaim and recycle these materials, many of which are valuable, some of the toxic materials

Table 3-1

ENVIRONMENTAL REGULATIONS THAT MAY AFFECT SELECTED INDUSTRIES

SIC Code:	2491	2879	3471	4213	4941	5191	5541	7216	7395
Industry:	Wood Preserving	Pesticide Formulators	Electroplaters	Trucking	Water Supply	Farm Supply Stores	Gasoline Service Stations	Dry Cleaning	Photo Labs
Program/Regulation									
AIR									
1 Rural Fugitive Dust									
2 Stratospheric Ozone									
3 Municipal Waste Combustors									
4 TSDF Air Standards									
5 Diesel Fuel Standards				i					
6 Diesel Particulate Standards				i					
7 Fuel Volatility				i			i		
8 Gas Marketing				?			D		
9 Lead Phasedown									
10 NAAQS: Lead									
11 NAAQS: Particulate Matter									
12 NESHAP: Chromium			D						
13 NESHAP: Perc Dry Cleaning								D	
14 NSPS: Small Boilers	?								
15 NSPS: Industrial Boilers									
16 NSPS: Woodstove									
RADIATION									
17 Radon									
18 Radiofrequency Guidance									
19 Low Level Radioactive Waste									
20 High Level Radioactive Waste									
PESTICIDES									
21 Inerts		?		?		?			
22 Farmworkers		D				D			
23 Pesticides in Groundwater		?				?			
24 Large Volume Pesticides									
25 Data Requirements									
26 Reregistration of Pesticides		?				?			
TOXIC SUBSTANCES									
27 Asbestos Ban and Phasedown									
28 Asbestos in Schools									
29 Chlorinated Solvents	?		?					?	
30 PCBs: Electical Equipment									
31 PCBs: Electrical Transformers									
32 Premanufacture Review Program		?				?			
SARA									
33 Title III of SARA	D	D	D	D		D	D	D	
RCRA									
34 Subtitle C Location Standards	i	i	i	i	i	i	i	i	i
35 Subtitle D Criteria	i	i	i	i	i	i	i	i	i
36 Liner and Leachate Collection	D	i	i	i	i	i	i	i	i
37 Corrective Action at SWMU	D	i	i	i	i	i	i	i	i
38 Hazardous Waste Burning	i	i	i	i	i	i	i	i	i
39 Municipal Ash									
40 Land Ban - First Thirds	i	D	D	i	i	D	i	i	i
41 Land Ban - Soil and Debris	i	D	D	i	i	D	i	i	i
42 Land Ban - Dioxin	D	D	D	D	i	D	i	i	i
43 Land Ban - Cal. List	D	D	D	i	i	D	i	i	i
44 UST Financial Responsibility				D		D	D	D	
45 UST Technical Standards				D		D	D	D	
46 Hazardous Waste Tank Standards	i	i	i	i	i	i	i	i	i
47 Toxicity Characteristic	D								i
48 Small Quantity Generator	D	D	D			?	D	D	D
49 Waste Oil Management				D			D		
CERCLA									
50 National Contingency Plan	i	i	i	i	i	i	i	i	i
51 CERCLA Settlement Policy	i	i	i	i	i	i	i	i	i

NOTE: D = direct impact; i = indirect impact (i.e., a cost increase); ? = uncertain impact

Table 3-1

FORTHCOMING EPA REGULATIONS THAT MAY AFFECT SELECTED INDUSTRIES

SIC Code:	2491	2879	3471	4213	4941	5191	5541	7216	7395
Industry:	Wood Preserving	Pesticide Formulators	Electroplaters	Trucking	Water Supply	Farm Supply Stores	Gasoline Service Stations	Dry Cleaning	Photo Labs
Program/Regulation									
DRINKING WATER									
52 Total Coliform Rule					D				
53 Surface Water Treatment - Filtration					D				
54 VOCs in Drinking Water					D				
55 SOCs in Drinking Water					D				
56 Inorganics in Drinking Water					D				
57 Fluoride in Drinking Water					D				
58 Lead MCL and Corrosion Control					D				
59 Lead Ban					D				
60 34 MCLs					D				
61 Radionuclides					D				
62 Disinfection					D				
63 Public Notification Rule					D				
GROUND WATER									
64 Well-head Protection	?	?	?	?		?	?	?	?
65 Class I Underground Injection Wells									
66 Class II Underground Injection Wells									
67 Class V Underground Injection Wells							i		
MUNICIPAL									
68 Construction Grants Program									
69 Secondary Treatment Waivers									
70 Municipal Sewage Sludge	i	i	i	i	i	i	i	i	i
71 State Sludge Management	i	i	?	i	i	i	i	i	i
72 Pretreatment		i	?						D
73 Stormwater	?								
74 Non-Point Sources									
SURFACE WATER									
75 Wetlands									
76 National Estuary Program		?				?			
77 Toxic Water Pollutants									
78 Ocean Dumping	i	i	i	i	i	i	i	i	i
79 ELG: Foundries									
80 ELG: Placer Gold Mining									
81 ELG: Machinery Manufacturing and Rebuilding			?	?			?		
82 ELG: Oil and Gas				i			i		
83 ELG: Organic Chemicals									
84 ELG: Pesticides		D							
85 ELG: Pulp and Paper									

NOTE: D = direct impact; i = indirect impact (i.e., a cost increase); ? = uncertain impact remain in electroplating wastewaters and solid wastes. In addition to these problems associated with hazardous wastes, electroplaters that use chromium may also have a problem with hazardous air emissions.

Most of the environmental expenditures for electroplaters over the next few years will have to do with handling and disposing of the sludge that is generated by these wastewater treatment systems and with the recordkeeping and reporting that will become a necessary part of handling toxic substances and hazardous wastes. One other potential expenditure -- emission controls for hexavalent chromium -- will apply only to the chrome plating segment of the industry.

Because electroplaters with fewer than 10 employees will be exempt from Section 313 of SARA Title III, their additional costs for the 1988-1992 period will be approximately $4,430 per year, with an additional cost of approximately $3,680 in the first year for the hazardous waste generator regulations. The estimated annual costs amount to about 32% of the median small electroplater's net profit and the additional first year costs amount to about 7% of their equity. Electroplaters at the lowest quartile of this size category averaged net profits of only $3,400 over the 1976-1983 period and lost $9,100 in 1983. Although the additional first year expenses amount to only 15% of their equity, the $4,430 in additional environmental expenses amounts to 130% of their net profits over the 1976-1983 period. These figures suggest that the electroplaters in this size category may experience difficulty managing the increased environmental costs. Because the $4,430 in annual expenses represents only about 2% of their average sales, it seems probable that many of these electroplaters will be able to adjust to the increased costs, but for some marginal electroplaters the additional expenses could present financial difficulties.

The relative impact of environmental regulations during the 1988-1992 period will be greatest on electroplaters with 10-19 employees. These are the smallest electroplaters that will be subject to Section 313 of SARA Title III. Section 313 may add $9,000 to these electroplater's annual costs, with an additional $3,000 in the first year. This $9,000 plus $4,430 of other expenses amounts to over 70% of the median electroplater's 1976-1983 net profits. Electroplaters at the lowest quartile in this size category averaged net profits of only $3,400 over the 1976-1983 period and lost $4,300 in 1983. The estimated environmental costs would amount to almost 400% of their average net profits. These figures suggest that many electroplaters with 10-19 employees will have difficulty meeting the costs of the environmental regulations.

Electroplaters in the next size category, 20-49 employees, may also experience some difficulty meeting the environmental requirements. Their costs will be approximately the same as those of the smaller electroplaters, and even though they have a larger annual profits, the annual costs are still relatively high. The median electroplater in this size category had net profits over 1976-1983 of $34,000 on equity of $228,000. The estimated annual environmental expenses of $13,430 amounts to 40% of their average 1976-1983 net profits. Electroplaters at the lowest quartile level averaged net profits of only $9,000 over 1976-1983 and experienced a $15,200 loss in 1983. The estimated environmental costs amount to almost 150% of their average net profits. Thus, some electroplaters in this size category also may have difficulty meeting the environmental requirements.

It is only in the next largest size category of 50-99 employees that the environmental expenses amount to less than 30% of the median electroplaters' net profits ($70,000). The electroplaters in the lowest quartile averaged net profits of $40,000, however, so that the estimated environmental costs amount to approximately 34% of these electroplater's annual net profits. Thus, the increased expenses will be high for some of the firms even in this larger size category.

WOOD PRESERVING

Almost all of the substances and chemicals used at a wood preserving facility are considered toxic or hazardous. In previous years, as the industry was developing, and environmental concerns were not an issue, the practices of many wood preserving facilities eventually contributed to serious contamination of the surrounding area's soil and water. Many of these facilities have had to implement extensive cleanup operations to correct these problems. The cleanup costs have strained the financial resources of many firms severely, and several firms have gone bankrupt.

Over the period 1988-1992, the cleanup of wood preserving facilities will continue, and wood preservers will be faced with new regulations governing the disposal of their hazardous wastes, the reporting of toxic chemicals, and the control of stormwater flows. The problems associated with these new regulations may involve not only increased costs, but also the unavailability of disposal sites. Wood preservers now are finding that there are no disposal alternatives available for their pentachlorophenol wastes.

Management and reporting of hazardous wastes and toxic chemicals will add approximately $14,300 in annual costs to wood preservers' environmental expenses. These costs amount to about 32% of the 1976-1983 median net profits for wood preservers in both the 10-19 and 20-49 employee size category, and over four times the reported 1983 net profits. In addition to these costs, some potentially large costs of forthcoming waste disposal regulations and potentially large capital costs associated with waste-minimizing technologies have not been included in the estimates. These figures all suggest that some wood preservers may have great difficulty meeting environmental expenses.

In addition to these increased annual costs, wood preservers may incur major construction costs to control stormwater. Although these regulations are still in the formative stages, the costs of some of the principal regulatory alternatives, such as constructing roofs or wastewater collection systems for storage yards, have been estimated to be $200,000 even for small facilities. Capital costs of this magnitude amount to 150% of the median equity of wood preservers with fewer than 10 employees, and about 80% of the median equity of those with 10-19 employees. Should costs prove to be as high as the preliminary estimates indicate, small wood preservers would find it very difficult to meet these requirements.

PESTICIDE FORMULATING AND PACKAGING

Pesticide formulating and packaging (PFP) firms handle many materials that are considered toxic and may present an environmental danger if spilled. Similarly, many of the wastes generated from PFP processes are considered hazardous. Process wastewaters from PFP firms may be contaminated with the toxic substances used and/or with the hazardous wastes generated. Finally, the pesticides produced by these firms are themselves dangerous and subject to stringent labeling and handling requirements.

The environmental regulations that will affect PFP firms directly during the period 1988-1992 include those concerned with the handling of toxic substances and hazardous wastes as well as those governing the handling and labeling of pesticides. The PFP plants that currently discharge wastewaters into municipal sewers also will be subject to categorical pretreatment standards at some time in the future.

The smallest PFP firms, those with 1-9 employees, will be exempt from the most costly regulation, Section 313 of SARA Title III, and will have annual costs of only $2,560. These firms should have no difficulty meeting environmental requirements. Larger PFP firms will face costs of $11,560 per year plus increased waste disposal costs and an additional $6,680 in the first year of regulation. They also may have to replace some of their labels at a cost of $1,000-$2,000 each. Although the capital costs are relatively low, the annual costs are about 37% of median net profits and about 200% of the net profits of firms at the lowest quartile level. These figures suggest that some firms may have difficulty meeting the requirements. Unlike firms in other industries, small PFP firms may have the option of discontinuing some of their operations rather than closing, if they cannot afford to meet these environmental requirements.

PFP firms will be subject not only to the current and forthcoming regulations that are covered in this study, but also to the continuation of and possible changes in the many existing regulations that govern the manufacture, distribution, and use of pesticides. Firms in the pesticide industry are subject to many environmental product regulations as well as regulations governing the discharge and disposal of residuals. Regulations governing the registration and labeling of pesticides, for example, already are a major factor in the PFP industry. EPA is considering changing many of these existing regulations, which may have a more profound effect on the PFP industry than the regulations covered in this study.

FARM SUPPLY STORES

Many farm supply stores handle pesticides, with the resultant environmental dangers in possible spillage. For those firms that offer pesticide application services, the mixing and use of these pesticides require stringent handling procedures so as not to contaminate the environment. In addition, those farm supply stores that provide fuels are concerned with potential spills and leaks from underground storage tanks containing gasoline or diesel fuel.

Which environmental regulations affect farm supply stores directly depends upon whether the stores handle pesticides and/or sell gasoline or diesel fuel. Farm supply stores that handle pesticides will be affected by new pesticide regulations concerning farmworkers and groundwater. For those farm supply stores that also provide petroleum products, the underground storage tank technical standards and financial responsibility requirements will apply. Farm supply stores will also be affected by reporting requirements for toxic chemicals and by restrictions on the land disposal of hazardous wastes.

A farm supply store with fewer than ten employees, that does not handle pesticides and does not sell petroleum fuels, would have no costs associated with the major regulations. A farm supply store that handles pesticides would face increased annual costs of approximately $2,100 and would have first-year costs associated with the farmworkers regulation of approximately $9,000. These annual costs amount to approximately 5% of annual net profits. The first-year costs amount to about 2% of the average store's equity. These figures suggest that farm supply stores that do not sell petroleum should be able to meet environmental requirements without difficulty.

A farm supply store that sells petroleum fuels would have increased annual costs of approximately $4,265, plus capital costs and additional first-year costs of approximately $11,900. These annual costs amount to about 10% of annual net profits. The capital and first-year costs amount to approximately 3% of equity. Again, these figures suggest that farm supply stores should be able to meet environmental requirements without difficulty. Farm supply stores that store petroleum or chemicals in underground storage tanks, may find that their tanks are leaking, however. In this event, they would face corrective action costs. If groundwater contamination or other serious damage must be repaired, these corrective action costs could exceed $100,000, and thus could exceed the equity of the smallest farm supply stores that are in less than average financial condition.

INTERSTATE TRUCKING

Environmental concerns associated with the trucking industry include potential spills and leaks from underground storage tanks (USTs) containing diesel fuel or used oil. If a trucking operation performs its own maintenance, then it uses solvents for degreasing parts. Waste disposal problems would involve used oil and spent cleaning solvents. The used oil might be put into USTs or into drums. The washing of trucks is done with chemicals and steam cleaning, creating wastewater runoff. For a tank truck, the "heel," or what is left in the tank after draining the previous haul, must be steamcleaned out and perhaps handled as a hazardous waste. Small trucking companies usually have these cleaning functions performed by outside services.

The principal environmental regulations that will affect the interstate trucking industry during the period 1988-1992 are those are intended to secure the underground storage of fuel and correct any damage caused by leaks. These regulations will apply only to those firms that store petroleum fuels on their premises or store waste oils in USTs. These are generally only the larger trucking companies. The other environmental regulations that will affect the interstate trucking industry will do so indirectly, increasing the price of trucks, fuel, or waste disposal.

Because the most costly regulations will affect only the larger firms, interstate trucking companies should be able to manage the costs of the environmental regulations included in this study. The costs of approximately $2,700 per year for UST and waste-oil regulations represent about 6% of the annual profits of the smallest companies likely to be affected by the regulations. The required investment of $3,000 to upgrade each UST represents about 2% of their net worth.

Trucking companies that find that their USTs have been leaking will face much higher costs, however, possibly exceeding $100,000. EPA's experience to date indicates that 15 percent to 20 percent of the USTs may be leaking. Some of these firms with leaking USTs may be unable to afford the required corrective actions.

GASOLINE SERVICE STATIONS

Environmental concerns at gasoline service stations include potential spills and leaks from USTs containing gasoline, diesel fuel, and/or used oil, and vapor emissions from the handling of gasoline. Waste disposal problems at retail gasoline outlets involve used oil and spent cleaning solvents.

The principal environmental regulations that will affect gasoline service stations between 1988 and 1992 are the technical standards for USTs, and the financial responsibility requirements for the owners and operators of USTs. In addition, gasoline service stations in certain areas that are not attaining air quality standards (e.g., St. Louis) will be required to install air emission controls on the nozzles of their gasoline pump hoses. Other EPA regulations that may affect retail gasoline outlets include regulations pertaining to generators of small quantities of hazardous waste.

The major impact of the environmental regulations upon gasoline service stations will depend mostly upon the status of the stations' USTs. The cleanup of even small releases could place the average station in a poor or distressed financial condition. The cleanup of large plume releases could result in the average station's failure. Fortunately, not all firms will incur corrective actions, and some states may use state funds to aid small firms in meeting the costs of corrective action. The capital investments required by the environmental regulations can be sustained by most small firms if they are allowed several years to make the expenditures. If, however, all capital expenditures under all regulations must be met in a two- to three-year period, only the strongest firms are likely to survive.

DRY CLEANING

Most of the environmental problems in the dry cleaning industry are related to dry cleaning solvents. Over the years there has been a pronounced trend away from the use of petroleum-based solvents and toward the use of perchloroethylene (perc). Over 84% of all dry cleaning facilities use perchloroethylene. Most of the remaining facilities use a petroleum-based solvent, and a small percentage use either fluorocarbon or trichloromethane. Environmental problems are created by the evaporation of these solvents and by the presence of these solvents in wastewaters and solid wastes. Spent solvents and wastes contaminated by solvents are considered hazardous. Dry cleaners that use petroleum-based solvents generally store these solvents in underground storage tanks, with the consequent environmental risks associated with spills and leaks.

The principal environmental regulations that will affect dry cleaners during the 1988-1992 period will be those that control the evaporation of perchloroethylene from perc dry cleaning machines, restrict the handling and disposal of hazardous wastes, and require the reporting of toxic chemicals stored on premises. Dry cleaners that use petroleum solvents will not be subject to the perchloroethylene air emission standards,[*] but may be subject to EPA's requirements for underground storage tanks. Dry cleaners also will be affected indirectly by a series of EPA regulations that will impose stricter standards on waste disposal in general, and hazardous waste disposal in particular.

The most expensive regulations will apply to selected dry cleaners -- namely, perc dry cleaners that have no emission controls (about 50%) and petroleum dry cleaners with regulated underground storage tanks. Unfortunately, the status of these two important regulations is still uncertain.

Businesses in the dry cleaning industry are among the smallest of the small. Most dry cleaners have fewer than five employees, and average sales per employee that are less than half the national average. The median dry cleaner with 1-9 employees in 1983 had profits of less than $10,000 and equity of less than $40,000. While their rate of return on equity was high, the profit available to absorb additional costs is low. Dry cleaners at the lowest quartile of profitability in this size category in 1983 had net profits of only $5,000 and equity of only $8,000.

Should perc emission controls be required of the smallest dry cleaners, current estimates show they may have to invest $6,000 or more for the perc controls plus an additional $4,300 for SARA and RCRA and will face additional annual costs of up to $2,800 to meet all of the regulatory requirements. These costs amount to about 35% of the median annual net profits and about 33% of the median equity of dry cleaners with 1-9 employees. Dry cleaners at the lower quartile level of this smallest size category will have to spend about 60% of their annual net profits and over 150% of their equity. These figures suggest that some of the smallest dry cleaners may have difficulty installing perc emission controls in addition to meeting the other environmental requirements. The perc regulation is still under formulation with many options under study, however, so that actual costs for perc emission controls may be much different than preliminary estimates.

Dry cleaners with regulated underground storage tanks will have to invest approximately $5,000 to upgrade their tanks[**] and meet the additional first-year costs and will face additional annual costs of approximately $3,200. These costs amount to about 35% and 55%, respectively, of the median annual net profits and equity of dry cleaners in the smallest size category. Dry cleaners at the lower quartile level of this size category will have to spend about 64% of their annual net profits and about 100% of their equity. These figures suggest that many of the smallest dry cleaners will have difficulty meeting UST standards. If their underground storage tanks are found to be leaking, these dry cleaners will face much larger costs to complete the required corrective actions. These costs could average over $50,000 and at times could exceed $100,000. Such costs would exceed the equity of the average dry cleaner even in the 10-19 employee size category. Many small dry cleaners will not have the resources to pay for such large corrective action costs.

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[*] Air emission standards for petroleum solvents may be established during the 1988-92 period, but for now EPA has deferred making this decision.

[**] These costs assume that USTs containing petroleum solvents are regulated as petroleum USTs. If they are regulated, instead, as chemical USTs, dry cleaners' upgrade costs will be greater.

PHOTOFINISHING LABORATORIES

There are five major chemical processing steps that are generally used in processing color film or paper: developing, stopping development, bleaching, fixing, and stabilizing. The developing solutions contain silver, a hazardous but also a valuable material. Some of the other solutions used in photofinishing processes, such as ferrocyanide bleach, are also hazardous. The silver and hazardous solutions are potential sources of environmental problems, if they are allowed to contaminate wastewaters or other wastes.

Because silver is a valuable metal, photofinishers recycle and reclaim the silver so that they generate little or no silver-containing wastes. Small photofinishers also avoid generating hazardous wastes by using nonhazardous bleaching solutions, such as iron EDTA. Finally, photofinishers that process 1,600 square feet of film or less each day are exempt from EPA's effluent limitations for wastewaters. Consequently, most small photofinishers have no substantial environmental problems and will not be affected directly by any of the environmental regulations covered in this study.

WATER SUPPLY

The water supply industry consists of both publicly owned and privately owned water supplies. Publicly owned water supplies are predominantly owned by local municipal governments, although a sizable number are owned by the federal government. Privately owned systems that serve large populations are usually investor-owned entities. Privately owned systems that serve smaller populations tend to be owned by real estate developers, homeowners associations, or mobile home parks.

Unlike most industries that EPA regulates, water supply companies do not discharge pollutants or produce hazardous substances. Instead, water supply companies produce a product, drinking water, that is itself considered to be an element of the environment. Consequently, EPA's regulations for water supply companies are similar to product specifications. Instead of establishing standards for the maximum discharge of pollutants, most drinking water regulations establish standards for the maximum level of contaminants permitted in the water that these systems supply to their customers.

Public water systems are regulated under the 1974 Safe Drinking Water Act (SDWA) and the 1986 Amendments to the Act. Under the 1986 Amendments, EPA is required to promulgate National Primary Drinking Water Regulations (NPDWRs) for 83 specific contaminants. The SDWA requires that regulations for these 83 contaminants, as well as other regulations discussed below, must be adopted on a very stringent schedule -- by June 19, 1989. In addition to the tight EPA regulatory schedule, NPDWRs must officially take effect at the state level within 18 months of promulgation, assuming the state fulfills primacy requirements.

Three other provisions of the SDWA are likely to have significant impacts on the drinking water industry. EPA is required to specify conditions under which public water systems served by surface water sources are required to install filtration as a treatment technique. EPA is also required to promulgate NPDWRs for disinfection as a treatment technique for all public water systems. Further, the SDWA mandates EPA to publish regulations that require public water systems to monitor for a number of "unregulated" contaminants at least once every five years. To help small systems comply with the disinfection requirement and the "unregulated" contaminants monitoring requirement, the SDWA authorizes funds for EPA and the states to provide assistance to small systems. These funds have not been appropriated.

Although the environmental requirements for water supply systems will be expensive, compliance costs ultimately will be reflected in increased rates and borne by customers. Due to often inadequate rate bases, small systems -- particularly those that serve fewer than 2,500 people -- and their customers face the greatest difficulty in financing the necessary compliance activities.

Water supply systems will have to monitor their water for a greater number of contaminants than is currently required and install appropriate treatment equipment if contaminants exist at unsafe levels. Some small systems will most likely have a significant number of violations until adequate treatment is in place; therefore, public notification of violations will be an additional expense.

Recognizing that small systems may be limited in their ability to comply with the new regulations, EPA is attempting to minimize the economic impact on small systems where possible without reducing the protection of public health. The SDWA provides an exemption procedure that allows water supply companies additional time to meet the new standards, provided that the water being delivered in the interim does not present an unreasonable risk to health. It is expected that exemption procedures will be used primarily to assist small supplies in achieving compliance. Water supply systems serving less than 500 service connections, or approximately 1,500 people, are eligible for extendible two-year exemptions. These extendible exemptions may be granted based upon the need for "financial assistance for the necessary improvements," unless there is an unreasonable risk to health.

SUMMARY

Table 3-2 presents a summary of the potential impacts of the regulations upon the selected industries and a list of the regulations that are most important for each industry. From this table, it is apparent that even among those industries that seemed upon first examination to be candidates for serious impacts, there is a wide variation in potential impacts. The study found that costs may be high for most small businesses in three of the industries -- electroplating, wood preserving, and pesticide formulating and packaging. If costs prove to be as high as estimated and cannot be passed on to consumers, some of these small businesses may be forced to discontinue part of their operations or to close. Costs also may be high for small businesses in certain segments of five other industries. Some small dry cleaners that have underground storage tanks or require substantial perchloroethylene emissions controls may have difficulty meeting environmental requirements. In addition, certain gas stations, trucking firms, and farm supply stores with leaking underground storage

Table 3-2

SUMMARY OF IMPACTS UPON SELECTED INDUSTRIES

Industry	Most Significant Regulations	Firms That Might Experience Difficulty
Electroplating	Toxic Chemicals Hazardous Waste Chromium Emissions*	Firms with 1-49 employees
Wood Preserving	Hazardous Waste Toxic Chemicals Corrective Action Stormwater Control*	Firms with 1-49 employees
Pesticide Formulating and Packaging	Toxic Chemicals Hazardous Waste	Firms with 10-19 employees
Farm Supply Stores	Pesticides UST Standards UST Corrective Action	Firms with leaking underground storage tanks
Interstate Trucking	UST Standards UST Corrective Action	Firms with leaking underground storage tanks
Gasoline Service Stations	UST Standards UST Corrective Action Hazardous Waste	Firms with leaking underground storage tanks
Dry Cleaning	UST Standards UST Corrective Action Hazardous Waste Perc Emissions*	Firms with 1-9 employees that have USTs or require perc emissions controls
Photofinishing Laboratories	None	None
Water Supply	Drinking Water Standards	Firms that serve fewer than 2,500 people

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* These regulations are still being formulated.

tanks may face corrective action costs beyond their financial means. Small private water supply companies are in a unique position, in that they operate as utilities and generally obtain rate increases that cover their increased costs. While these firms would not be expected to go out of business, high treatment costs for water supply companies that fail to meet new drinking water standards may necessitate large increases in household usage fees. Environmental costs for one of the industries studied -- photofinishing laboratories -- were found to be negligible.

The environmental regulations that appear to be most often responsible for high costs in the industries studied are those covering the handling and reporting of toxic chemicals; the handling, treatment, and disposal of hazardous wastes; and the operation of underground storage tanks. Although costs estimates are available for only some of these regulations, those that are available indicate that the regulations will affect a large number of firms in many industries and may entail costs in the $5,000 to $10,000 range. While these costs may be managed easily by small businesses of moderate size, they present difficulties for the smallest of the small businesses. It is these very small businesses that comprise the majority of U.S. businesses.

Chapter 4

CONCLUSIONS AND POLICY CONSIDERATIONS

This study has examined the environmental regulations that will have the most effect upon small businesses during the 1988-1992 period to assess their potential impacts on these businesses. Although the study has not had the benefit of complete information on the regulations or the industries studied, it has been possible to delineate which small businesses may be most affected by the environmental regulations, describe what many of these small businesses will have to do to comply with the regulations, compare the estimated costs of the environmental regulations with the financial resources of small businesses in the industries studied, and identify the characteristics of small businesses in each industry that might experience difficulty meeting environmental requirements. Although the conclusions must be regarded as preliminary, the study provides insight into potential problem areas that might be investigated for future policy initiatives.

CONCLUSIONS

Although the list of EPA's 85 regulations appears to be foreboding, a closer examination reveals that seventy percent of the 3.5 million small businesses in the United States are in sectors of the economy that produce little or no pollution--wholesale and retail trade, finance, and services. Most of these businesses will not be affected directly by any of the 85 regulations. Small businesses that contribute to environmental problems will incur additional costs to comply with the regulations, however, and in some industries the costs may be high.

Analysis of nine of these industries has identified small businesses in eight of these industries that might have difficulty meeting environmental requirements. These include:

1. Industries in which many small businesses may have difficulty meeting basic environmental requirements.

   This study has identifies three industries--electroplating, wood preserving, and pesticide formulating and packaging -- in which the costs of environmental regulations that affect all businesses in the industry amount to a significant portion of the annual profits and/or equity of the smallest businesses. In one industry -- wood preserving--

these costs are large, $200,000+ for construction of stormwater control systems, while in two industries the costs are relatively moderate, $5,000-$10,000 for hazardous waste and toxic chemical management and reporting, but present difficulties because the annual profits of many small business in these industries are so low.

2. Industries in which small businesses with special processes or equipment will have difficulty.

   This study indicates that most dry cleaners will be able to afford the cost of environmental regulations, but small dry cleaners that have to install emission controls for perchloroethylene or use underground tanks to store their cleaning solvents may have difficulty.

3. Industries in which small businesses with environmental problems will have difficulty.

   In some industries, only the small businesses that have environmental problems will have difficulty meeting regulatory requirements. These include businesses that have contaminated the environment -- gasoline service stations or trucking companies with leaking underground storage tanks, for example -- and businesses that must correct other environmental problems -- water supply companies that must install expensive purification systems, for example.

The potential for financial difficulties in an industry does not mean that many small businesses in that industry will be forced to close. In some industries-- pesticide formulating and packaging and farm supply stores, for example -- the owners may be able to discontinue some products or services and still remain in business. In other industries -- water supply systems, for example -- owners may be able to pass the increased costs on to their customers. In some industries, however, the options available to small businesses will be very limited.

The regulations that appear to be most often responsible for high costs in the industries studied are those covering the handling and reporting of toxic chemicals; the handling, treatment, and disposal of hazardous wastes; and the operation of underground storage tanks. Although costs estimates are available for only some of these regulations, those that are available indicate that the regulations will affect a large number of firms in many industries and may entail costs in the $5,000 to $10,000 range. Although these costs may be managed easily by small businesses of moderate size, they present difficulties for the smallest of the small businesses. It is these very small businesses that comprise the majority of U.S. businesses.

For most industries, the study found that the paperwork costs associated with environmental regulations would be minor, less than $200 per year. Recordkeeping and reporting required for toxic chemicals under SARA Title III, however, could cost the average small business $10,000 per year. EPA has provided options, such as range reporting, that should allow small businesses to reduce their costs below these average estimates, however. The other regulations that were found to entail large paperwork costs were the corrective action requirements under RCRA. The clean-up of hazardous waste sites often involves extensive planning. These planning studies and periodic progress reports were estimated to cost an average of $46,000 for extensive corrective action programs.

POLICY CONSIDERATIONS

Environmental regulations are created to reduce the risk to human health, welfare, and the environment from pollution and hazardous substances. All of the industries studied that will experience significant adverse impacts because of environmental regulations are industries that produce substantial environmental risk. Any discussion of the adverse impacts of environmental regulations on these industries must be balanced by a discussion of the benefits that are generated by these same regulations. Cleaning up sites contaminated by hazardous waste disposal or leaking underground storage tanks reduces the exposure of individuals to carcinogens, reclaims and prevents further contamination of drinking water supplies, and restores property values. Controlling the emissions of perchloroethylene from dry cleaning machines reduces both ambient and occupational exposure to a carcinogen. To the extent permitted by law the regulatory process at EPA includes balancing the costs and impacts of environmental regulations with the benefits produced by reducing these environmental risks.

This study has provided a number of insights into the potential impacts of EPA's regulations on small businesses. While EPA's primary mission is to reduce the risks posed by environmental damage, the Agency also seeks to minimize the unnecessary adverse social and economic impacts of its regulations whenever appropriate. In this context, the results of this study suggest a number of policy initiatives as well as areas for further study.

Policy Initiatives

Because many of the new environmental programs cut across many industries and affect thousands of small businesses, new compliance strategies may be needed to supplement EPA's traditional enforcement efforts. Many of the policy initiatives suggested below will help small businesses learn about and comply with the new environmental regulations. This in turn will assist the Agency in achieving higher rates of compliance among small businesses.

These policy initiatives are not necessarily new to EPA. The Agency's Small Business Ombudsman already operates several programs to assist small businesses and the Office of Research and Development (OR&D) is engaged in developing several new technologies for pollution control. The problem areas highlighted by this study provide specific focuses for existing and new programs alike.

Environmental Technology

It may be possible to reduce environmental costs to small businesses by developing lower-cost control technologies or standardizing existing technologies so that they can be made available at affordable prices.

The results of this study suggest many areas in which new technologies might help solve the special problems of small businesses. Potential projects might include new ways to control stormwater drainage from wood preservers' storage yards, for example, or new processes for dealing with soil that has been contaminated by leaking underground storage tanks.

Even when appropriate technology exists, the required equipment may be available only on a customized basis. By working with the regulated community of small businesses and informing manufacturers of the potential market, EPA might be able to bring down the costs of existing technologies.

Environmental Services

In some cases, required environmental services are not available to small businesses or are available only at restrictive prices. Many wood preservers, for example, have no disposal facilities available for some of their hazardous wastes. Electroplaters and dry cleaners are also concerned about the availability of disposal alternatives for their hazardous wastes. Similarly, many small businesses that own underground storage tanks are finding that no companies will sell them the required environmental insurance. EPA might work with the regulated community and potential service providers to expand the options available to small businesses.

Exemplary Programs

For some of the new environmental regulations, thousands of similar small businesses may have to prepare almost identical responses. Their costs might be reduced considerably, if exemplary programs or responses could be made available. Paperwork costs might be reduced, for example, by examples for answers that will be the same for most businesses in a category. Exemplary emergency response programs and employee training programs might be developed as well.

Education and Training

Sometimes, simply learning how to comply with environmental requirements can be an expensive and time-consuming task for small business owners and operators. Education programs and packages could help to reduce this expense. Such programs could include seminars, response lines, pamphlets and other written materials, and video training programs.

Joint Programs

Policy initiatives such as those suggested above can be undertaken by EPA on its own or can be carried out with the help of other government agencies. New environmental control technologies, for example, could be developed by and for small businesses through the SBA's Small Business Innovative Research grants, with research targeting problem areas identified in this study. Educational programs could be developed with the U.S. Department of Commerce. State and local governments could be enlisted in the effort as well.

For many programs, it might be desirable to obtain the cooperation of the industries affected. Programs could be developed with industry trade associations, for example, to further define potential problems and to jointly prepare solutions. Alternatively, EPA development efforts could be supported by small business advisory teams.

Continued Analysis

This study has pointed to several potential problem areas for small businesses. Additional research might provide more insight into these problems or might show that the problems will not be as large as this preliminary study has suggested. This study also has highlighted the value of detailed small business analysis. EPA can improve the quality of its analyses by maintaining a current data base of financial statistics on small businesses.

Small Business Analyses

By focusing on industries dominated by small businesses and by paying particular attention to the smallest businesses in these industries, this study has shown how detailed analysis can be especially useful in determining whether environmental regulations will have significant impacts on small businesses. Under the Regulatory Flexibility Act, EPA has a mandate to conduct such analyses for each of its regulations.

The detailed analysis of small businesses was made possible through the use of the Fin/Stat data base provided by the U.S. Small Business Administration (SBA). Because SBA discontinued this data base in 1983, the data used was slightly out of date. Nevertheless, it provided useful information on the financial capabilities of small businesses.

EPA could improve the quality of its small business analyses by obtaining a current data base of financial statistics. Sharing a common data base would provide EPA's several offices with a common frame of reference for small business analyses and would help to develop more standardized analytic methods. Research would be necessary to determine the best source of such a data base and the best format for its maintenance. The SBA could be helpful in preparing the data base, and with other regulatory agencies such as the Occupational Safety and Health Administration, might be interested in sharing the data base with EPA.

Multi-Regulation Impact Analyses

This study has identified several industries for which the combined effects of several environmental regulations will result in considerably more impact than the effects of any one regulation taken alone. Continued analysis of the combined effects of all of EPA's regulations on those industries identified as being subject to many regulations will help the Agency maintain a broader perspective of regulatory impacts and will put the impacts of new regulations in a more accurate perspective.

Regulatory Analyses

This study has pointed to a number of potential problem areas associated with individual regulations. Continued analysis of these regulations will not only provide better information on the actual economic impacts of this regulations, but will also provide insights into how the regulations might be improved.

A good example of a regulation that might bear further analysis are those promulgated under Title III of SARA. The cost for an "average small business" to comply with Section 313 has been estimated to be approximately $9,000 per year, a cost that appears to be prohibitive for many of the small businesses included in this study. Cost estimates for Section 313 have been prepared, however, using assumptions of an average number of toxic chemicals reported and an average level of analysis. Furthermore, the estimates do not consider that many small businesses will be able to take advantage of the range-reporting option that EPA has developed to reduce their reporting costs. Thus, many small businesses included in this study may be able to comply with Section 313 at a cost that is considerably lower than that estimated. Continued analysis of how small businesses actually comply with these regulations will enable EPA to better assess not only the impacts but also the efficacy of the regulations.

APPENDICES

A. ELECTROPLATING

B. WOOD PRESERVING

C. PESTICIDE FORMULATING AND PACKAGING

D. FARM SUPPLY STORES

E. INTERSTATE TRUCKING

F. GASOLINE SERVICE STATIONS

G. DRY CLEANING

H. PHOTOFINISHING LABORATORIES

I. WATER SUPPLY

J. ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

NOTES

Appendix A

ELECTROPLATING

Electroplating is a process by which a second type of metal is deposited onto the surface of a metal product. The metal parts are passed through a series of baths in which they are cleansed, rinsed, and plated. The plating bath consists of a metal and, in many applications, a low concentration cyanide solution.

In 1986, there were 3,222 firms primarily engaged in the plating, polishing, anodizing and coloring industry (SIC 3471). This industrial classification includes electroplaters, also known as metal finishers. Although there are only 3,222 firms in SIC 3471, there are several times that many firms that conduct electroplating activities. These include manufacturers of automobiles, appliances, and other products that are made with plated parts. The 3,222 firms in SIC 3471 employed 68,409 people and had total sales of approximately $3 billion ($45,000 per employee). Almost half (44 percent) of these firms had fewer than 10 employees and 91 percent had fewer than 50 employees. Only 97 firms had more than 100 employees. Firms with fewer than 50 employees accounted for 51 percent of industry sales and 56 percent of industry employment. (See Table A-1.)

The U.S. Small Business Administration (SBA) classifies as small businesses all firms in SIC 3471 with fewer than 500 employees. Under this definition all but 4 of the firms (99.9%) in SIC 3471 in 1986 were considered small businesses.

A typical small electroplater has 10-12 employees and annual sales of approximately $500,000. Such a firm operates out of a single urban location. There are also many small electroplaters with 20-50 employees and annual sales of $1-$1.5 million.

ENVIRONMENTAL PROBLEMS

The electroplating process requires the use of many toxic and hazardous materials, such as metals and solvents. Although electroplaters generally reclaim and recycle these materials, many of which are valuable, some of the toxic materials remain in electroplating wastewaters and solid wastes. In addition to these problems associated with hazardous wastes, electroplaters that use volatile solvents may also have a problem with hazardous air emissions.

Table A-1

SMALL BUSINESSES IN THE ELECTROPLATING INDUSTRY - 1986

(SIC 3471)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	650	775	806	690	204
Cumulative Share of:					
Firms	20%	44%	69%	91%	97%
Sales	3%	9%	23%	51%	71%
Employment	3%	10%	26%	55%	75%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

The electroplating process generates a variety of wastewaters and finally a sludge which is stored in a tank or in drums until it is contract-hauled off-site for disposal in a secure landfill. EPA has promulgated a series of effluent guidelines setting standards for wastewater discharges from electroplating facilities. Most electroplaters are now in compliance with these guidelines.

The sludge produced from wastewater treatment contains many hazardous substances, principally metal hydroxides, and is listed as a hazardous waste. A small plating operation might generate as much as 700 pounds of sludge (equivalent to 75 gallons) every week.[1] This sludge is the primary waste generated from the electroplating process. Most electroplaters now store their sludge in a tank or in drums until it is contract-hauled off-site for disposal in a secure landfill.

ENVIRONMENTAL REGULATIONS

The principal environmental regulations that will affect electroplaters during the period 1988-1992 deal primarily with the handling and disposal of toxic chemicals and hazardous wastes. Chrome platers will also have to comply with forthcoming regulations controlling air emissions of hexavalent chromium. These regulations are summarized in Table A-2.

Paperwork requirements associated with these regulations will include applying for an EPA identification number and maintaining a manifest system to track shipments of hazardous wastes and completing all of the emergency planning, notification, and release reports associated with handling toxic chemicals. The costs associated with this paperwork burden are presented in Table A-3.

Regulations with a Direct Impact

CAA: Chromium NESHAP

Hexavalent chromium emissions from electroplating operations are to be regulated under the Clean Air Act. EPA has estimated that there are an estimated 9,750 chrome platers subject to potential regulation. EPA's regulatory options have not been prepared yet, nor is there any information available on potential control costs.

RCRA: Generators of 100 to 1,000 kg/mo

The Hazardous and Solid Waste Amendments of 1984 require EPA to regulate generators of hazardous wastes that produce between 100 and 1,000 kilograms per month. The EPA requirements include obtaining an EPA identification number, maintaining a uniform manifest system, installing management controls, and meeting a limited set of performance standards. EPA's final rule was promulgated in March 1986 and became effective September 22, 1986.

The costs to a small electroplating operation based on EPA estimates are as follows:[2]

Table A-2

ENVIRONMENTAL REGULATIONS
for the
THE ELECTROPLATING INDUSTRY
(SIC 3471)

Act/Regulation	Requirements	Cost to Small Business	Comments
Direct Impact			
CAA: Chromium NESHAP	undetermined	undetermined	
RCRA: Generators of 100-1,000 kg/mo	manifest, proper handling	$3,680 first year, $1,560 per year	Most firms complying now.
RCRA: Land Disposal Bans	treat sludges before disposal	$1,870 per year	Estimate for small firms.
SARA: Title III	recordkeeping and reporting of toxic chemicals	$1,000/yr: chemical reports; $9,000/yr: toxic release forms	Do some now. If <10 emp, no txc rls frms.
Indirect Impact			
RCRA: Hazardous Waste Regulations	higher waste disposal costs	undetermined	
Uncertain Impact			
CWA: Machinery ELG	undetermined	undetermined	
CWA: Pretreatment and Sludge Mgt.	undetermined	undetermined	
SDWA: Wellhead Protection	activity bans near drinking water wells	undetermined	May apply to few firms, if any.
TSCA: Chlorinated Solvents	undetermined	undetermined	

Table A-3

PAPERWORK BURDEN

ELECTROPLATING
(SIC 3471)

Regulation/Activity	One-Time Costs	Annual Costs	Comments
Small Quantity Generators			
Notification	$63		
Manifest & Recordkeeping		$108	Pick-ups twice yearly
SARA Title III			
Emergency Planning			
Inventory, Evaluation, Notification	$150		First Year Only
Emergency Planning Committee	$472		Second Year Only
Recordkeeping		$56	
Hazardous Chemical Inventory		$1,000 $400	First year only Subsequent years
Toxic Release Inventory		$12,000 $9,000	First year only Subsequent years
TOTAL PAPERWORK COSTS	$685	$13,164 $9,564	First Year Subsequent Years

	Initial	Annual
Manifesting, Recordkeeping, Packaging & Labeling	$2,230	$ 220
Transportation Costs		$ 840
On-site Accumulation Costs	$1,450	$ 50
Disposal		$ 250
Treatment	______	$ 200
Total Costs	$3,680	$1,560

Compliance costs for an individual firm may vary depending on waste characteristics, proximity of the landfill, and site-specific waste disposal practices already in effect.

The paperwork burdens associated with this regulation include a one-time requirement to obtain an EPA identification number and annual recordkeeping requirements associated with the manifest system. EPA estimates that the costs of obtaining the identification number will be approximately $60[3] and the annual cost of maintaining the manifest will be approximately $1,08[4]. These costs are included in the table above.

RCRA: Land Disposal Bans

RCRA Section 3004(e) limits the wastes that may be disposed of using land disposal. For electroplaters, this means that they will no longer be able to send their untreated sludges to landfills. Instead, the sludges will have to be treated before disposal in a landfill. EPA estimates that treatment will add approximately $0.48 per gallon to the costs of disposing of electroplaters' wastewater sludges.[5] Assuming that small electroplaters generate 75 gallons of sludge each week (see Environmental Problems above), their additional annual costs for waste disposal would amount to approximately $1,870.

Title III of SARA

Sections 302 - 304 of SARA impose requirements for notification, emergency planning, and emergency notification on any facility using, processing, or storing extremely hazardous substances in amounts above the established threshold levels for those substances. EPA has estimated costs per facility for this rule over a three-year period, FY'87 - FY'89. First year costs which include inventory, evaluation, and notification are about $150. Projected costs for the second year, $472.50, are much higher. This is assuming that the facility will participate in the development and implementation of the community's Emergency Planning Committee. Third year costs, primarily recordkeeping, are estimated to be about $56.[6] Many electroplaters are complying with sections 302 - 304.

Sections 311 and 312 of SARA require businesses to submit Material Safety Data Sheets (MSDS) or alternative lists as well as hazardous chemical inventory forms to three government agencies: the State Emergency Response Commission, the local Emergency Planning Committee, and the local Fire Department. The MSDSs are the same forms already required by the Occupational Health and Safety Administration (OSHA), which establishes the reporting thresholds. Sections 311 requirements were effective on October 15, 1987; Section 312 on March 1, 1988. EPA estimates that the costs to comply with sections 311 and 312 will average $1,000 per facility for the first year with annual costs for the following years averaging about $400.[7] These costs will depend upon how many MSDSs are required and whether the MSDSs are supplied by vendors. Most electroplaters already are maintaining the MSDS forms required for OSHA compliance.

Section 313 requires facilities to complete a toxic chemical release form for each toxic chemical that was manufactured, processed, or otherwise used in quantities exceeding the established toxic chemical threshold quantity during the preceding calendar year. Section 313 applies only to businesses within SIC codes 20 - 39 (manufacturing) and exempts from reporting all facilities with fewer than 10 employees. Section 313 went into effect in June 1987. Toxic chemical release forms are to be submitted annually beginning in 1988. For section 313, the costs will depend upon the number of toxic chemicals for which each firm must submit a release form. EPA has estimated that the costs for an average small business submitting 10 forms will be about $12,000 in the first year and $9,000 per year thereafter.[8] The costs for small electroplaters could be substantially less, however, because they will not have so many forms and should be able to complete the forms themselves, rather than having to pay for consulting services. In addition, EPA has provided for range reporting that will allow small businesses to provide more general information and thereby reduce analytic costs. The 1,539 small electroplating firms (46% of SIC 3471) with fewer than 10 employees would be exempt from any costs associated with section 313.

EPA considers all of the requirements associated with Title III of SARA to be paperwork requirements. The paperwork costs associated with this regulation, therefore, are the costs estimated above.

Regulations with an Indirect Impact

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Regulations under the CWA and MPRSA on the ocean dumping of wastes and the incineration of hazardous wastes at sea will also have an impact on waste disposal practices. The list of regulations that fall into this category includes:

RCRA
- Subtitle C Location Standards
- Subtitle D Criteria
- Liner and Leachate Collection
- Corrective Action at SWMUs
- Hazardous Waste Burning
- Land Ban - Dioxin and Spent Solvents
- Land Ban - California List
- Land Ban - Soil and Debris
- Hazardous Waste Tank Standards
- Toxicity Characteristics

CERCLA National Contingency Plan
CERCLA Settlement Policy

CWA Ocean Dumping

These regulations will affect electroplating firms directly only if they maintain a waste storage, disposal, or treatment facility on their property. For the purposes of this analysis, it is assumed that small electroplating firms will contract out all of their waste disposal needs. As discussed above, these regulations will affect small electroplaters indirectly, however, by making it more difficult and more expensive for them to dispose of their wastes. Thus, the costs of their waste disposal can be expected to increase. Unfortunately, no estimates are available of the likely magnitude of such cost increases.

Regulations with an Uncertain Impact

CWA: ELG Machinery Manufacturing and Rebuilding

This regulation could establish effluent limitations guidelines and standards for the machinery manufacturing, rebuilding, and maintenance (MM&R) industries. The regulatory approach, if any, will be prepared in FY'88.

The electroplating industry will be studied in Phase II of EPA's development effort. The effect on small businesses depends on the depth and breadth of the regulation and the extent to which water is used in the process. Costs cannot be estimated until the regulatory options are developed.

CWA: Pretreatment and Sludge Management Programs

New standards for municipal pretreatment programs and for the management of sludge generated by both public and private wastewater treatment works may affect electroplaters that discharge wastewaters into municipal sewers. Although electroplaters should be meeting pretreatment standards already, more aggressive municipal pretreatment programs may lead to additional expenditures for some firms. At the same time that pretreatment is becoming more efficient, standards for the management of the sludge produced by the pretreatment processes are becoming more stringent. Electroplaters may find disposal of their wastewater treatment sludge becoming more difficult and more expensive. The combined effects of these regulations may increase some electroplater's wastewater treatment costs.

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the SWDA. The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, certain electroplating activities may be banned. This program will affect only those electroplaters that are located near drinking water wells. The number of such firms and the potential impact upon their activities has not yet been determined.

TSCA: Chlorinated Solvents

An interagency regulatory group, the Chlorinated Solvents Project, is investigating options for regulating chlorinated solvents. This interagency group consists of representatives from EPA, FDA, OSHA, and The Consumer Products Safety Commission (CPSC). This project is currently in the option selection stage for the dry cleaning industry. Metal finishing is one of the industries targeted for future regulation, but no options have been proposed at this time.

IMPACT OF THE REGULATIONS

Small businesses in the electroplating industry tend to be larger than small businesses in many of the other industries examined in this study. As shown in Table A-4, the average electroplater had revenues of almost $500,000 during the 1976-1983 period and average net profits of $24,000. The equity of the average electroplater in 1983 was in excess of $100,000. The median electroplater in the smallest size category, fewer than 10 employees, had sales of about $200,000 with net profits of $14,000 and equity of $55,000. The median firm among electroplaters with 20-49 employees, on the other hand, had revenues of $875,000 with net profits of over $30,000 and equity of over $200,000.

Table A-5 presents a summary of the expected costs for electroplaters of various sizes to comply with the environmental regulations included in this study. It is important to note that Table A-5 includes only those environmental costs for which estimates are available. The costs of controlling emissions of hexavalent chromium, for example, are not included. The reporting costs for SARA Title III are those estimated for an average small business. Actual costs for small electroplaters may be much less. The costs associated with the RCRA land disposal bans are based upon a single estimate of 75 gallons per week of sludge for a "small" electroplater. Unfortunately, this estimate does not provide any information that would make it possible to vary the costs by production volume. Thus, the same cost estimate is used for electroplaters with sales of $200,000 per year and sales of $500,000 per year.

Because electroplaters with fewer than 10 employees will be exempt from Section 313 of SARA Title III, their additional costs for the 1988-1992 period will be approximately $4,430 per year, with an additional cost of approximately $3,680 in the first year for the hazardous waste generator regulations. The estimated annual costs amount to about 32% of the median small electroplater's net profit and the additional first year costs amount to about 7% of their equity. Electroplaters at the lowest quartile of this size category averaged net profits of only $3,400 over the 1976-1983 period and lost $9,100 in 1983. Although the additional first year expenses amount to only 15% of their equity, the $4,430 in additional environmental expenses amounts to 130% of their net profits over the 1976-1983 period. These figures suggest that the electroplaters in this size category may experience difficulty managing the increased environmental costs. Because the $4,430 in annual expenses represents only about 2% of their average sales, it seems probable that many of these electroplaters will be able to adjust to the increased costs, but for some marginal electroplaters the additional expenses could present financial difficulties.

Table A-4

FINANCIAL PROFILE: 1976-1983
(median values in $1,000)

ELECTROPLATING
(SIC 3471)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$177	$400	$875	$2,240	$3,999	$483
Expenses and Taxes	163	381	841	2,162	3,896	459
Net Profit	14	19	34	78	103	24
Assets	85	189	427	1,160	1,922	232
Equity	55	103	228	545	987	128
Return on Equity	25%	18%	15%	14%	10%	19%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Table A-5

REGULATORY COSTS FOR TYPICAL SMALL BUSINESSES
in the
THE ELECTROPLATING INDUSTRY
(SIC 3471)

Firm #1: 6 employees, sales = $200,000/yr, net profit = $12,000/yr, equity = $44,000.

Act/Regulation	One-Time Costs	Annual Costs
RCRA: Generators of 100-1,000 kg/mo	$ 3,680	$ 1,560
RCRA: Land Disposal Bans		$ 1,870
SARA: Title III		
311 & 312	-	$ 1,000
TOTAL COSTS	$ 3,680	$ 4,430

Firm #2: 12 employees, sales = $500,000/yr, net profit = $18,000/yr, equity = $120,000.

Act/Regulation	One-Time Costs	Annual Costs
RCRA: Generators of 100-1,000 kg/mo	$ 3,680	$ 1,560
RCRA: Land Disposal Bans		$ 1,870
SARA: Title III		
311 & 312	-	$ 1,000
313	$ 3,000	$ 9,000
TOTAL COSTS	$ 6,680	$13,430

The relative impact of environmental regulations during the 1988-1992 period will be greatest on electroplaters with 10-19 employees. These are the smallest electroplaters that will be subject to Section 313 of SARA Title III. Section 313 may add $9,000 to these electroplater's annual costs, with an additional $3,000 in the first year. This $9,000 plus $4,430 of other expenses amounts to over 70% of the median electroplater's 1976-1983 net profits. Electroplaters at the lowest quartile in this size category averaged net profits of only $3,400 over the 1976-1983 period and lost $4,300 in 1983. The estimated environmental costs would amount to almost 400% of their average net profits. These figures suggest that many electroplaters with 10-19 employees will have difficulty meeting the costs of the environmental regulations.

Electroplaters in the next size category, 20-49 employees, may also experience some difficulty meeting the environmental requirements. Their costs will be approximately the same as those of the smaller electroplaters, and even though they have a larger annual profits, the annual costs are still relatively high. The median electroplater in this size category had net profits over 1976-1983 of $34,000 on equity of $228,000. The estimated annual environmental expenses of $13,430 amounts to 40% of their average 1976-1983 net profits. Electroplaters at the lowest quartile level averaged net profits of only $9,000 over 1976-1983 and experienced a $15,200 loss in 1983. The estimated environmental costs amount to almost 150% of their average net profits. Thus, some electroplaters in this size category also may have difficulty meeting the environmental requirements.

It is only in the next largest size category of 50-99 employees that the environmental expenses amount to less than 30% of the median electroplaters' net profits ($70,000). The electroplater in the lowest quartile averaged net profits of $40,000, however, so that the estimated environmental costs amount to approximately 34% of these electroplater's annual net profits. Thus, the increased expenses will be high for some of the firms even in this larger size category.

CONCLUSION

Over the past several years, most electroplaters have made substantial investments in wastewater treatment systems. Most of their added expenditures over the next few years will have to do with handling and disposing of the sludge that is generated by these wastewater treatment systems and with the recordkeeping and reporting that will become a necessary part of handling toxic substances and hazardous wastes. One other potentially large expenditure, emission controls for hexavalent chromium, may involve significant expenditures, but will apply only to the chrome plating segment of the industry.

A comparison of the estimated costs of recent and forthcoming environmental regulations with the reported financial performance of small electroplaters in various size categories suggests that many electroplaters with 1-49 employees may have difficulty meeting the environmental requirements. Some of the less profitable electroplaters in the next largest size category, 50-99 employees, may also have difficulty.

Appendix B

WOOD PRESERVING

The demand for wood products that can withstand the rapid deterioration brought on by insects, rotting, and fire has given rise to the wood preserving industry. Wood preserving facilities usually specialize in treating a limited range of products. Those using inorganic preservatives treat mostly dimension lumber, posts, and poles for insect and rot resistance and fire retardancy; plants using organic preservatives treat primarily poles, railroad ties, and pilings.

In 1986, there were 370 firms primarily engaged in wood preserving (SIC 2491). These firms employed 10,392 people and had total sales of approximately $850 million ($100,000 per employee). Almost half (43 percent) of these firms had fewer than 10 employees and 86 percent had fewer than 50 employees. Only 21 firms had more than 100 employees. Firms with fewer than 50 employees accounted for 43 percent of industry sales and 43 percent of industry employment. (See Table B-1.)

The U.S. Small Business Administration (SBA) classifies as small businesses all firms in SIC 2491 with fewer than 500 employees. Under this definition all of the firms in SIC 2491 in 1986 were considered small businesses.

There are two stages in the wood preserving process. First, the wood is preconditioned to reduce the moisture content, then it is treated with preservatives. The most common method of preconditioning is pressure steaming in a retort (cylinder), followed by vacuum drying. This method is widely recognized as producing a superior product. Other methods include seasoning in large, open yards; kiln drying; heating in a preservative bath under reduced pressures; and vapor drying.

Wood treating can use either a pressure or non-pressure process. In the non-pressure processes the wood is immersed in open tanks containing the preservatives. According to a 1985 survey, only 17 facilities use non-pressure processes today.[1] In the pressure process, the preservative is forced into the wood under pressure in a retort, or cylinder.

The layout of a typical pressure treatment facility includes three major processing areas:

1. A raw materials storage yard;
2. A treating cylinder (retort), or pressure vessel, with the necessary pumps, tanks and control equipment;
3. A boiler plant to heat the solution and to pressurize the cylinder;

Table B-1

SMALL BUSINESSES IN THE WOOD PRESERVING INDUSTRY - 1986

(SIC 2491)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	72	82	75	88	27
Cumulative Share of:					
Firms	21%	43%	62%	86%	93%
Sales	2%	8%	18%	43%	60%
Employment	2%	8%	17%	43%	59%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

4. A seasoning and storage yard, including the cylinder loading track and auxiliary transportation facilities.

The steel treating cylinders (retorts), typically used in pressure treatment, are from 4 to 10 feet in diameter and up to 175 feet in length. These are the most important component of the plant.[2]

Wood preserving plants use both organic (oilborne) and inorganic (waterborne) materials. Some of the organic materials used are pentachlorophenol, and creosote solutions. Today, many plants in Georgia and Florida are doing away with creosote, because it has presented numerous problems concerning worker safety and excessive contamination of the soil and groundwater. The principal inorganic material used is CCA, a solution of copper, chromium, and arsenic salts. Other inorganic salts--principally borates, phosphates, and ammonium compounds -- are used as fire retardants. A 1985 survey showed that 63% of the wood treated was treated with waterborne preservatives, 25% with creosote solutions, 10% with pentachlorophenol and 2% with fire retardant chemicals.[3]

To characterize the typical wood preserving plant, it is necessary to differentiate between those plants treating with waterborne preservatives and those treating with oilborne preservatives.

The typical plant treating with waterborne preservatives uses CCA, has one cylinder 50-60 ft. long, and employs fewer than 12 people. The type of wood treated (primarily lumbers and timbers used for fences, posts, poles and decks) can be handled more easily and processed much faster than that requiring the oilborne treatment. Normal treating time in the cylinder is about two hours, enabling a plant to complete three to four charges a day. A 1985 survey reports an average of 797,040 cu. ft. of wood treated with waterborne preservatives per facility for that year.[4]

The typical plant treating with oilborne preservatives uses creosote and pentachlorophenol, operates two to three cylinders, 100 - 175 ft. long and employs 20-40 people. The wood treated here is primarily hardwood, used for poles, railroad ties, pilings and bridge switches. The treatment time is about 18 hours in the cylinder so that each cylinder charge takes one to two days. Because the pieces of wood treated here are generally much larger and heavier, more labor is required for handling and treating the wood. These facilities, needing more machinery and larger treatment and storage areas are physically larger than waterborne plants. The same 1985 survey reports an average of 1,451,790 cu.ft. of wood treated with oilborne preservatives per facility that year.[5]

ENVIRONMENTAL PROBLEMS

Almost all of the substances and chemicals used at a wood preserving facility are considered toxic or hazardous. In previous years, as the industry was developing, and environmental concerns were not an issue, the practices of many wood preserving facilities eventually contributed to serious contamination of the surrounding area's soil and water. Creosote especially tends to be rapidly absorbed into the soil and leaches into the groundwater. Many plants were ordered to create holding ponds to catch the waste runoff, but subsequent inspections found that the substances were still leaching into the ground from the holding ponds and that the ground around the ponds was contaminated. Many of these facilities have had to implement extensive clean-up operations to comply with RCRA corrective action regulations. The cleanup costs have strained the financial resources of many firms severely and several have closed.

The principle waste streams generated by the wood preserving process are:

1. Leftover water from pressure treatment which may be sent to on-site surface impoundments or may be discharged into municipal sewers. On-site surface impoundments were standard years ago, but very few are in use today.

2. Wastes leached from the treated wood set outdoors to dry. Over time this would accumulate in the soil and groundwater.

3. Sludge collected in storage tanks and in treatment systems. The sludge is comprised of wood preservatives and chemical impurities.[6]

Ideally, wood preservers use what is called a "closed system". Most of the facilities constructed in the last 20 to 30 years use such a system. This method allows for the steam and condensate to be recycled and reused. Most of the waste accumulated is residue left over from cleaning out the cylinders and mixtures of oil, water, and preservatives. These wastes generated from the treatment process need to be disposed of in hazardous waste landfills.

Those facilities using pentachlorophenol, which contains low levels of certain dioxins, have a problem disposing of their wastes, because it is now illegal to dispose of any dioxin-containing wastes in a landfill. Incineration is the only acceptable method of disposal and there are no incinerators permitted at the present time to take this waste.[7] It is assumed that most plants are storing these wastes on site until there are disposal alternatives available. If and when incineration becomes an option, the supply and demand factor will most likely make it a very costly service.

ENVIRONMENTAL REGULATIONS

Because many wood preserving chemicals are toxic and many wood preserving wastes are hazardous, EPA has been looking closely at the industry's chemical use and waste disposal practices. In the early 1980's, the Agency reviewed the use of wood preservatives under FIFRA and decided to continue their authorization with certain modifations and use restrictions. Now, the Agency is proposing to regulate under RCRA some 700 wood preserving plants and about 2,000 sawmills that treat raw lumber.[8] The greatest impact will be on plants treating with creosote and pentachlorophenol. Under these regulations, costs for waste disposal, permitting, and corrective-action will be substantial. A summary of the principal environmental regulations that will affect the wood preserving industry during the period 1988-1992 is presented in Table B-2.

Paperwork requirements associated with these regulations will include applying for an EPA identification number and maintaining a manifest system to track

Table B-2

ENVIRONMENTAL REGULATIONS
for the
THE WOOD PRESERVING INDUSTRY
(SIC 2491)

Act/Regulation	Requirements	Cost to Small Business	Comments
Direct Impact			
RCRA: Listing WP Wastes	concrete pads under storage	$200,000	Regulation not final
RCRA: Land Ban - First Thirds	incineration, stabilization	$5,000 per year	Assumes 20 bbl of sludge/year
RCRA: Land Ban - Dioxin	testing, incineration	higher disposal costs	Alternatives not selected
RCRA: Land Ban - California List	testing, proper disposal	higher disposal costs	Maybe only penta plants
RCRA: Liner and Leachate Standards	double liners, leachate collectn	cost estimates not available	Will close disposal sites
RCRA: Corrective Action	close sites, repair damage	$200,000 to $2.0 million	Contaminated sites only
RCRA: Toxicity Characteristic	testing, disposal as haz. waste	higher waste disposal costs	Negotiations under way
RCRA: Generators of 100-1,000 kg/mo	manifest, proper handling	$3,680 initial $1,560 annual	Most firms now complying
SARA: Title III	recordkeeping and reporting of toxic chemicals	$1,000/yr: chemical reports; $9,000/yr: toxic release forms	Do some now If <10 emp, no txc rls frms
Indirect Impact			
RCRA: Hazardous Waste Regulations	higher waste disposal costs	undetermined	
Uncertain Impact			
CAA: Industrial Boilers NSPS	testing, install controls	undetermined	Most plants not affected
SDWA: Wellhead Protection	activity bans near wells	undetermined	May apply to few firms
TSCA: Chlorinated Solvents	undetermined selection stage	undetermined	May not apply to industry

shipments of hazardous wastes and completing all of the emergency planning, notification, and release reports associated with handling toxic chemicals. Some wood preservers will have extensive paperwork requirements associated with corrective action regulations. The costs incurred by this paperwork burden are presented in Table B-3.

Regulations with a Direct Impact

RCRA: Generators of 100 to 1000 kg/mo

The Hazardous and Solid Waste Amendments of 1984 require EPA to regulate generators of hazardous wastes that produce between 100 and 1000 kilograms per month. The EPA requirements include obtaining an EPA identification number, maintaining a uniform manifest system, installing management controls, and meeting a limited set of performance standards. EPA's final rule was promulgated in March 1986 and became effective September 22, 1986.

The costs to a small wood preserving plant based on EPA estimates are as follows:[9]

	Initial	Annual
Manifesting, Recordkeeping, Packaging & Labeling	$2,230	$ 220
Transportation Costs		$ 840*
On-site Accumulation Costs	$1,450	$ 50
Disposal		$ 250
Treatment	______	$ 200
Totals	$3,680	$1,560

Compliance costs for an individual firm may vary depending on waste characteristics, proximity of the landfill, and site-specific waste disposal practices already in effect.

The paperwork burdens associated with this regulation include a one-time requirement to obtain an EPA identification number and annual recordkeeping requirements associated with the manifest system. EPA estimates the cost of obtaining the identification number to be about $63[10] and the annual cost of maintaining the manifest to be approximately $108.[11] These costs are included in the table above.

RCRA: Land Ban - First Thirds

EPA's land disposal regulations for the first third of the scheduled wastes listed under RCRA Section 3001 require wood preservers that use creosote and/or pentachlorophenol to treat wastewaters and wastewater treatment sludges to the concentration levels achieved by treating wastewaters by chemical precipitation and the resulting sludges by incineration and stabilization. EPA estimates that the

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* Yearly transportation costs have been estimated at $1,882, when the waste must be transported more than 200 miles.

Table B-3

PAPERWORK BURDEN

WOOD PRESERVING
(SIC 2491)

Regulation/Activity	One-Time Costs	Annual Costs	Comments
Small Quantity Generators			
Notification	$63		
Manifest & Recordkeeping		$108	Pick-ups twice yearly
SARA Title III			
Emergency Planning			
Inventory, Evaluation, Notification	$150		First Year Only
Emergency Planning Committee	$472		Second Year Only
Recordkeeping		$56	
Hazardous Chemical Inventory			
Reporting		$1,000 $400	First year only Subsequent years
Toxic Release Inventory			
Toxic Chemical Release Forms		$12,000 $9,000	First year only Subsequent years
TOTAL COSTS	$ 685	$13,164 $9,564	First year Subsequent Years
Other Potential Costs			
RCRA - Corrective Action			
Corrective Action Studies	$46,000 (site-specific)		If hazardous waste damage on site.

disposal costs for the sludge will increase tenfold, from $0.50 to $5.00 per gallon.[12] This would raise the cost of disposing of a 55-gallon barrel of sludge from $28 to $275. The incremental cost associated with this regulation, therefore, is about $250 per barrel of sludge.

The amount of wastewater sludge generated by a wood preserving facility in a year can vary greatly. Plants that use steam treating processes can generate 100-200 barrels of wastewater a year. How this wastewater is treated and how much sludge is produced depends upon the technology employed. As discussed above, wood preservers are minimizing waste generation as much as possible. Many have switched from steam treatment to dry kilns or have switched to waterborne preservatives such as CCA. With these new technologies, wood preservers can reduce their sludge generation to less than 10 barrels a year. Increased waste disposal costs associated with this regulation, therefore, could vary from $2,000 to over $50,000 per year.

Given the tenfold increase in disposal costs, it is unlikely that wood preservers will continue to generate large quantities of wastewater sludge. The ultimate costs associated with this regulation may be the capital costs of installing alternative preserving technologies rather than the increased annual costs of sludge disposal. These capital costs could be large, however, over $100,000 in some cases.

RCRA: Land Ban - Dioxin

On November 8, 1986 the EPA land ban of certain dioxin-containing wastes went into effect. The restrictions are based on the requirement that extracts from wastes be tested for concentrations of specified constituents. Wastes whose extracts contained less than the specified concentrations could be land disposed; wastes generating extracts with higher contaminant levels would have to be treated prior to being land disposed. Because there is currently no permitted or certified capacity for incinerating or otherwise treating the affected dioxin-containing wastes, EPA has delayed the effective date of the rule for two years, until November, 1988.

Wood preserving plants using pentachlorophenol are most likely to generate dioxin-containing waste and will be affected heavily by this regulation. In attempting to estimate costs for incinerating dioxin wastes, EPA surveyed commercial facilities currently incinerating PCBs (there are no incinerators currently disposing of dioxin-containing wastes). Reported disposal prices were about $1,500 per metric ton.[13] The cost of incinerating dioxin-containing wastes, of course, may be different.

RCRA: Land Ban - California List

On July 8, 1987 the EPA promulgated regulations restricting land disposal of certain "California list" wastes: liquid hazardous wastes containing polychlorinated biphenyl (PCBs) above specified concentrations: and hazardous wastes containing halogenated organic compounds (HOCs) above specified concentrations (1000 mg/kg). EPA has defined the HOCs that must be included as any compounds having a carbon-halogen bond. Pentachlorophenol falls into this category and all facilities using this chemical may have to comply with the regulation. The effect of this regulation will be to require wood preservers to dispose of these wastes only at permitted hazardous waste facilities. This will increase waste disposal costs. No estimates are available of the potential cost.

RCRA: Liner and Leachate Collection Standards

All new, replacement and expanded landfills and surface impoundments continuing to receive waste after Nov. 8, 1984 are subject to Minimum Technology Requirements. The rule sets minimum design standards for various types of hazardous waste management facilities. These requirements are primarily for double liner containment and collection systems. Only plants managing waste on-site are affected. The compliance deadline for interim status surface impoundments is Nov. 8, 1988.

Most wood preservers with surface impoundments will close them rather than pay the high costs associated with meeting these standards. Thus, the principal effect of these standards upon wood preservers will be to accelerate corrective actions and closures at wood preserving sites that have landfills or surface impoundments. No estimates of the costs of these activities are available.

RCRA: Listing of Wood Preserving Wastes

EPA is considering listing as hazardous wastes several waste streams generated by the wood preserving industry. Some of the wastes targeted are dripage, wastewater, wastewater treatment residuals, and process residuals.

This regulation would require wood preservers either to protect their treated wood from rain by constructing coverings for the drip pads and storage areas, or to collect and then treat the rainwater that falls on their drip pads and storage areas. An EPA Economic Impact Analysis estimates that compliance costs would range from about $200,000 for a small wood preserving plant to almost $800,000 for a large plant.[14] These estimates assume that the drip pads and storage area at a small wood preserving plant cover 1/4 to 1/2 acres.

RCRA: Toxicity Characteristic

According to 40 C.F.R. § 261.20, a solid waste is a hazardous waste if it exhibits any one of four specific characteristics identified by the RCRA regulations. These characteristics are ignitibility, corrosivity, reactivity and EP toxicity. A solid waste exhibits the characteristic of EP toxicity if, using approved testing methods, the extract from a representative sample of the waste contains any of the contaminants listed in Table I of 40 C.F.R. § 261.24 at a concentration greater than the threshhold value given.

On June 13, 1986 EPA proposed amendments to hazardous waste identification regulations under Subtitle C of RCRA by expanding the Toxicity Characteristic to include 38 additional chemicals and by introducing a new extraction procedure to be used. EPA also introduced a second generation leaching procedure, the Toxicity Characteristic Leaching Procedure, (TCLP), used to address the mobility of organic and inorganic compounds in the ground.

Two wood preserving wastes already trigger the characteristic of EP Toxicity: arsenic (>5 mg/l) and chromium (>5 mg/l) and must be managed under RCRA.[15] The proposed amendment will include three creosol compounds and three chlorophenol compounds typically found in wood preserving wastes. The rule will probably be finalized in August, 1988. When this goes into effect, these additional compounds will be added to the list of wood preserving wastes that are considered hazardous and must be disposed of in permitted facilities. Because these substances are already handled by wood preserving facilities as hazardous wastes, no additional costs should be incurred.

RCRA: Corrective Action

The final HWSA codification rule requires that any Subtitle C permit issued to a RCRA facility after the date of enactment must require corrective action for all releases of hazardous wastes from solid waste management units (SWMUs) as well as hazardous waste management units at the facility. The final rule grants EPA the authority to issue corrective action orders to interim status facilities to clean up releases from both solid and hazardous waste management units on a site-specific basis. This rule went into effect on July 26, 1985.

Many of the wood preserving facilities in the south, primarily Georgia and Florida, are presently engaged in extensive clean-up activities. As discussed before, these plants engaged in practices that caused serious contamination of the soil and water. The law gives them until November 8, 1988 to clean up and dispose of their wastes in a specified landfill. One plant in Georgia spent $200,000 in clean-up costs; others are spending $1 to $2 million.[16] The costs of corrective action under this regulation will depend on the degree of contamination, which in turn depends on factors such as permeability of the soil, how long the facility has been operating, what waste disposal practices were used, etc. Thus, the corrective action costs are highly site-specific and are directly related to the environmental problems at each site.

The paperwork burdens associated with this regulation include preparing plans, periodic reports, final reports, and summaries. Substantial additional burdens may be imposed on a site-specific basis depending on whether contamination of the soil and/or groundwater is discovered. EPA estimates a one-time cost per facility for paperwork activities of $46,000.[17]

Title III of SARA

Sections 302 - 304 of SARA impose requirements for notification, emergency planning, and emergency notification on any facility using, processing, or storing extremely hazardous substances in amounts above the established threshold levels for those substances. EPA has estimated costs per facility for this rule over a three-year period, FY'87 - FY'89. First year costs which include inventory, evaluation, and notification are about $150. Projected costs for the second year, $472.50, are much higher. This assumes that the facility will participate in the development and implementation of the community's Emergency Planning Committee. Third year costs, primarily recordkeeping, are estimated to be about $56.[18] The wood preserving industry has requested clarification from EPA as to whether certain of their chemicals or compounds thereof are actually listed as extremely hazardous. They already report pyrene, a constituent of creosote, as extremely hazardous.

Sections 311 and 312 of SARA require businesses to submit Material Safety Data Sheets (MSDS) or alternative lists as well as hazardous chemical inventory forms to three government agencies: the State Emergency Response Commission, the local Emergency Planning Committee, and the local Fire Department. The MSDSs are the same forms already required by the Occupational Health and Safety Administration (OSHA), which establishes the reporting thresholds. Section 311 requirements were effective on October 15, 1987; Section 312 on March 1, 1988. EPA estimates that the costs to comply with sections 311 and 312 will average $1,000 per facility.[19] These costs will depend upon how many MSDSs are required and whether the MSDSs are supplied by vendors. All wood preservers must comply with Sections 311 and 312 and should be doing it now.

Section 313 requires facilities to complete a toxic chemical release form for each toxic chemical that was manufactured, processed, or otherwise used in quantities exceeding the established toxic chemical threshold quantity during the preceding calendar year. Section 313 applies only to businesses within SIC codes 20 - 39 (manufacturing) and exempts from reporting all facilities with fewer than 10 employees (most of SIC 2491 -- See Table B-1). Section 313 went into effect in June 1987. Toxic chemical release forms are to be submitted annually beginning in 1988. The typical facility submitting 10 forms would expend about 400 labor hours a year. The forms are technical and lengthy and ideally should be filled out by a chemist or an engineering specialist. The industry is recommending that facilities file a form for each listed chemical (or compound thereof) in a solution to insure compliance with the law.[20] This would indicate that EPA's estimate of first year costs for this rule of $12,000 to $13,000 per facility is not an overstatement. EPA estimates second year costs to be lower, about $9,000.[21] These costs could also be higher given that threshold levels for reporting probably will be decreased.

EPA considers all of the requirements associated with Title III of SARA to be paperwork requirements. The paperwork costs incurred by this regulation are the costs estimated above.

Regulations with an Indirect Impact

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Regulations under the CWA on the ocean dumping of wastes will also have an impact on waste disposal practices. The list of regulations that fall into this category includes:

RCRA	Subtitle C Location Standards
	Subtitle D Criteria
	Hazardous Waste Burning
	Land Ban - Soil and Debris
	Hazardous Waste Tank Standards
CERCLA	National Contingency Plan
	CERCLA Settlement Policy
CWA	Ocean Dumping

As discussed above, many wood preserving companies formerly disposed of their wastes on site. These companies are now having to upgrade their disposal practices to meet these new EPA standards. In most cases, the wood preserving companies will close their waste disposal facilities and correct any damage to the soil and groundwater. They will then have to find disposal alternatives off of their plant sites. EPA's RCRA, CERCLA, and CWA regulations will affect wood preservers indirectly by making it more difficult and more expensive for them to dispose of their wastes off-site. Unfortunately, no estimates are available of the likely magnitude of such cost increases.

Regulations with an Uncertain Impact

CAA: Industrial Boilers NSPS

Standards of performance limiting emissions of sulfur dioxide (SO_2) from coal and oil-fired industrial, commercial, and institutional boilers were promulgated on December 16, 1987.

Some wood preservers use coal or oil-fired boilers in the Boultonizing process (preconditioning the wood) or to fire kilns, but the majority of facilities use wood chips or are switching to the use of wood chips.[22] The impact of this regulation on the industry as a whole is probably minimal, but because no Regulatory Flexibility Analysis has been prepared, the potential impacts remain uncertain.

CWA: Review

The Water Quality Act of 1987 requires EPA to establish a schedule for the review/reevaluation of effluent guidelines and standards. This review may have an impact on the wood preserving industry.

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the SDWA. The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, certain wood preserving activities, at plants that are located near drinking water wells could be banned. The number of such firms and the potential impact upon their activities has not yet been determined.

TSCA: Chlorinated Solvents

An interagency regulatory group, the Chlorinated Solvents Project, is investigating options for regulating chlorinated solvents. This interagency group consists of representatives from EPA, FDA, OSHA, and The Consumer Products Safety Commission (CPSC). This project is currently in the option selection stage for the dry cleaning industry. Wood preserving is not one of the industries targeted for future regulation, but wood preservers do use chlorinated solvents in their process.

IMPACT OF THE REGULATIONS

Table B-4 presents a financial profile of wood preservers over the 1976-1983 period. During this period, the median wood preserving companies in both the 10-19 and 20-49 employee size categories had sales of approximately $1.3 million per year and net profits of about $50,000 on equity of about $300,000. These figures may be misrepresentative, however, because the major environmental expenditures for wood preservers did not occur until the end of the survey period. In 1983, the median wood preserving company included in SBA's statistics had sales of $1.3 million, but net profits of only $4,000 on equity of about $550,000, and the median wood preserving company with 20-49 employees experienced a loss of $3,400.

The environmental costs facing a typical wood preserver with 20 employees are summarized in Table B-5. Firms with hazardous waste problems remaining on their sites will face very large corrective action costs, but even the firms that have corrected their problems will face very large costs from new environmental regulations. While the annual costs for firms without hazardous waste problems are about 32% of median net profits for the 1976-1983 period, they are about four times median 1983 net profits, and the capital costs are very high -- about 66% of the equity of the median firm over the 1976-1983 period and about 37% of 1983 equity. For firms at the lower quartile of the industry, the capital costs amount to about 130% of their average equity over the 1976-1983 period, and almost 200% of their equity in 1983. These figures and the list of environmental regulations facing the wood preserving industry suggest that many wood preserving companies could have great difficulty meeting the environmental requirements.

CONCLUSION

Over the past several years, wood preservers throughout the country have been making dramatic changes in their facilities and processes in order to correct environmental problems. These changes have been extremely expensive and many wood preservers have had to close their facilities because they could not afford the required environmental actions. Over the period 1988-1992 the cleanup of wood preserving facilities will continue and wood preservers will be faced with new regulations governing the disposal of their hazardous wastes, the reporting of hazardous and toxic materials handled on site, and the control of stormwater runoff. More wood preserving wastes will be considered hazardous and more of these wastes will be banned from land disposal facilities. The problems associated with these new regulations may involve not only increased costs, but also the unavailability of disposal sites. Wood preservers now are finding that there are no disposal alternatives available for their pentachorolphenol wastes.

A comparison of the estimated costs of recent and forthcoming environmental regulations with typical industry financial statistics suggests that many wood preservers will have difficulty meeting the regulatory requirements.

Table B-4

FINANCIAL PROFILE : 1976-1983
(median values in $1,000)

WOOD PRESERVING
(SIC 2491)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$303	$1,000	$1,712	$4,552	$9,538	$1,292
Expenses	266	899	1,616	4,159	8,969	1,191
Net Profit	18	51	48	196	285	51
Assets	249	493	809	2,891	5,148	538
Equity	133	253	391	954	2,115	307
Return on Equity	14%	20%	12%	21%	13%	16%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Table B-5

REGULATORY COSTS FOR TYPICAL SMALL BUSINESSES
in the
THE WOOD PRESERVING INDUSTRY
(SIC 2491)

Firm #1: 20 employees, sales = $1.3 million/yr, net profit = $50,000/yr, equity = $300,000. No hazardous waste problems on site.

Act/Regulation	One-Time Costs	Annual Costs
SARA: Title III		
311 & 312	-	$ 1,000
313	$ 3,000	$ 9,000
RCRA: Generators of 100-1,000 kg/mo	$ 3,680	$ 1,560
RCRA: Land Ban - First Thirds		$ 5,000
RCRA: Land Disposal Bans, Toxicity Characteristic	-	increased disposal costs
RCRA: Listing of Wood Preserving Wastes	$ 200,000	-
TOTAL COSTS	$ 206,680	$16,560 + increased disposal costs

Firm #2: 20 employees, sales = $1.3 million/yr, net profit = $50,000/yr, equity = $300,000. Hazardous waste problems on site.

Act/Regulation	One-Time Costs	Annual Costs
SARA: Title III		
311 & 312	-	$ 1,000
313	$ 3,000	$ 9,000
RCRA: Generators of 100-1,000 kg/mo	$ 3,680	$ 1,560
RCRA: Land Ban - First Thirds		$ 5,000
RCRA: Land Disposal Bans, Toxicity Characteristic	-	increased disposal costs
RCRA: Listing of Wood Preserving Wastes	$ 200,000	-
RCRA: Corrective Action	$200,000 - $2 million	-
TOTAL COSTS	$400,000 - $2.2 million	$16,560 + increased disposal costs

Appendix C

PESTICIDE FORMULATING AND PACKAGING

Pesticide formulating and packaging firms (PFP firms) combine pesticide active ingredients with substances such as diluents, emulsifiers, and wetting agents to produce and/or package pesticides for distribution and sale. Pesticide formulators and packagers are distinguished from pesticide manufacturers, which manufacture the active ingredients used in pesticides. PFP firms do not manufacture active ingredients. Instead, they purchase the active ingredients and combine them with other substances to produce a pesticide that is ready to use. Some of the firms primarily engaged in pesticide formulating and packaging may have expanded their activities to include the manufacture of a small quantity of active ingredients, but this is not their primary activity. Generally, it is only the large PFP firms that also manufacture active ingredients. PFP firms are also to be distinguished from firms that merely repackage and/or distribute pesticides. Distributors do not formulate or package pesticides. Instead, they purchase pesticides already packaged and resell them.

In 1986, there were 338 firms primarily engaged in SIC 2879, which includes PFP firms among the general classification of pesticide and agriculture chemical firms not elsewhere classified. Although there are only 338 firms in SIC 2879, several times that many firms conduct PFP activities. These include those firms whose primary activity is the manufacture of chemicals and fertilizers. The 338 firms in SIC 2879 employed 10,691 people and had total sales of approximately $3.5 billion ($145,000 per employee) in 1986. Most (59%) of these firms had fewer than 10 employees and 90% had fewer than 50 employees. Only 16 firms had more than 100 employees, but these 16 firms accounted for 58% of industry sales and employment. Firms with fewer than 50 employees accounted for 35% of industry sales and 29% of industry employment. (See Table C-1.)

The U.S. Small Business Administration (SBA) classifies as small businesses all firms in SIC 2879 with fewer than 500 employees. Under this definition all but 3 of the firms (99.1%) in SIC 2879 in 1986 were considered small businesses.

Although the statistics on SIC 2879 in Table C-1 indicate that 59% of PFP firms have fewer than 10 employees, most very small firms are discontinuing formulation of pesticides and are concentrating instead on distribution activities. This general trend in the industry is the result of increased formulating and packaging activity by the manufacturers of active ingredients as well as existing EPA, OSHA, and other regulations, and of the increased complexity of the regulatory environment. It is no longer feasible for firms with only a few employees to keep up with all of the regulatory requirements or to bear the liabilities that are associated with pesticide

Table C-1

SMALL BUSINESSES IN THE PESTICIDE AND AGRICULTURAL CHEMICAL INDUSTRY

(SIC 2879)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	111	90	54	50	17
Cumulative Share of:					
Firms	33%	59%	75%	90%	95%
Sales	3%	9%	16	35%	42%
Employment	3%	8%	15	29%	39%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

manufacture. The small businesses that remain pesticide formulators generally have 20-50 employees or more. Firms of this size had average annual sales of $2-$10 million and more over the 1976-1983 period and had average profits of $70,000 to $250,000. Their equity was generally in excess of $500,000. (See Table C-4) While firms in this category are also small businesses, they are in a better position to deal with complex environmental regulations than are the smallest businesses in SIC 2879.

ENVIRONMENTAL PROBLEMS

PFP firms handle many materials that are considered toxic and therefore present an environmental danger if spilled. Similarly, many of the wastes generated from PFP processes are considered hazardous. Process wastewaters from PFP firms may be contaminated with the toxic substances used and/or with the hazardous wastes generated. Finally, the pesticides produced by these firms are themselves dangerous and subject to stringent labeling and handling requirements.

The hazardous wastes generated by PFP firms include contaminated rinsates, pesticide dustbags, and collected process wastewaters.[1] Because pesticides and active ingredients used in pesticides are valuable products, the PFP industry has a financial incentive to use as much product as possible. Thus, PFP firms practice extensive recycling and generate relatively small amounts of waste. Nevertheless, these wastes are hazardous and must be disposed of properly.

ENVIRONMENTAL REGULATIONS

The environmental regulations that will affect PFP firms directly during the period 1988-1992 include those concerned with the handling of toxic substances and hazardous wastes as well as those governing the handling and labeling of pesticides. The PFP plants that currently discharge wastewaters into municipal sewers also will be subject to categorical pretreatment standards at some time in the future.[2] Table C-2 presents a summary of the current and forthcoming environmental regulations that will affect PFP firms.

PFP firms will be subject not only to the current and forthcoming regulations that are the subject of this study, but also to the continuation of and possible changes in the many existing regulations that govern the manufacture, distribution, and use of pesticides. As discussed in Chapter 2, firms in the pesticide industry are subject to many environmental product regulations as well as regulations governing the discharge and disposal of residuals. Regulations governing the registration and labeling of pesticides, for example, already are a major factor in the PFP industry. EPA is considering changes to many of these regulations. These changes in existing regulations may have a more profound effect on the PFP industry than the regulations covered in this study.

Paperwork requirements for PFP firms will include applying for an EPA identification number and maintaining a manifest system to track shipments of hazardous wastes and completing all of the emergency planning, notification, and release reports associated with handling toxic chemicals. The costs associated with this paperwork burden are presented in Table C-3.

Table C-2

ENVIRONMENTAL REGULATIONS
for the
THE PESTICIDE FORMULATING AND PACKAGING INDUSTRY
(SIC 2879)

Act/Regulation	Requirements	Cost to Small Business	Comments
Direct Impact			
CWA: Pretreatment Guidelines	undetermined	undetermined	
RCRA: Generators of 100-1,000 kg/mo	manifest, proper handling	$3,680 first year, $1,560 following years	
RCRA: Land Disposal Bans	send wastes to haz. disp. sites	increased waste disposal costs	
SARA: Title III	recordkeeping, reporting of toxic chemicals	$1,000/yr: chemical reports; $9,000/yr: toxic release forms	Do some now. If <10 emp, no txc rls frms.
FIFRA: Farmworkers	new labels	$1,000-$2,000/label	May cost less.
Indirect Impact			
RCRA: Hazardous Waste Regulations	higher waste disposal costs	undetermined	
Uncertain Impact			
CWA: National Estuary Program	permits and monitoring	undetermined	Only firms near estuaries
SDWA: Wellhead Protection	activity bans near wells	undetermined	Few firms, if any.
FIFRA: Pesticides in Groundwater	monitoring, restricted use	undetermined	Only selected products.
FIFRA: Registration of Pesticides	testing, new labels, restricted use, recordkeeping	undetermined	
FIFRA: Inerts	solvent bans	undetermined	
TSCA: Premanufacture Review Program	notify EPA of new chemicals	$5,400 to $12,700 per PMN	Mfrs. of pest. intermediates.

Table C-3

PAPERWORK BURDEN

PESTICIDE FORMULATING AND PACKAGING
(SIC 2879)

Regulation/Activity	One-Time Costs	Annual Costs	Comments
RCRA: Generators of 100-1,000 kg/mo			
Notification	$63		
Manifest & Recordkeeping		$108	Pick-ups twice yearly
SARA Title III			
Emergency Planning			
Hazard Evaluation,	$150		1st year costs
Planning Committee,	$472		2nd year costs
Recordkeeping		$56	3rd year costs
Notification of accidental releases			Case-specific
Hazardous Chemical Inventory			
Reporting (submit MSDSs)		$1,000	First year only
		$391	Subsequent years
Toxic Release Inventory			
Toxic Chemical Release Forms		$12,000	First year only
		$9,000	Subsequent years
Trade Secrets			
Justification Statements	$450		Most covered under mixture rule
Provide Information to Health Professional	$115		Case-specific
FIFRA: Farmworker Protection			
Reporting, Recordkeeping, Data Collection		$65	May be additional labeling costs
TOTAL COSTS	$1,250	$13,229	First year
		$9,500	Subsequent years

Regulations with a Direct Impact

CWA: Pretreatment Guidelines

The Clean Water Act requires EPA to act to control wastewater discharges from the pesticide industry. Effluent limitation guidelines for direct dischargers in the PFP industry are in effect already. Pretreatment guidelines for indirect dischargers are scheduled to be repromulgated in 1991. PFP firms will then have three years to comply.

These regulations will apply to those PFP firms that currently discharge wastewaters into municipal sewers. Although no analysis is available yet for these regulations, previous analyses suggest that, for small PFP firms, wastewater flows will be low enough to make contract hauling and incineration feasible. These firms will have no capital costs associated with the new regulations and will be able to minimize annual costs by reusing their process wastewaters, a practice that is now common throughout the industry.

The paperwork burden associated with this regulation will depend upon the option that EPA chooses. PFP firms that eliminate all wastewater discharges should no longer have any paperwork associated with this regulation, however.

RCRA: Generators of 100 to 1000 kg/mo

The Hazardous and Solid Waste Amendments of 1984 require that EPA regulate generators of hazardous wastes that produce between 100 and 1000 kilogram per month. Regulations require obtaining an EPA identification number, maintaining a uniform manifest system, installing management controls, and meeting a limited set of performance standards. EPA's final rule was promulgated in March 1986 and became effective September 22, 1986.

The costs to a small PFP firm based on EPA estimates are as follows:[3]

	Initial	Annual
Manifesting, Recordkeeping, Packaging & Labeling	$2,230	$ 220
Transportation Costs		$ 838*
On-site Accumulation Costs	$1,450	$ 53
Disposal		$ 250
Treatment		$ 200
Total Costs	$3,680	$1,560

Compliance costs for an individual firm may vary depending on waste characteristics, proximity of the landfill, and site-specific waste disposal practices already in effect.

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* Yearly transportation costs have been estimated to be $1,880, when the waste has to be transported more than 200 miles.

The paperwork burdens associated with this regulation include a one-time requirement to obtain an EPA identification number and annual recordkeeping requirements associated with the manifest system. EPA estimates that the costs of obtaining the identification number will be approximately $60[4] and the annual cost of maintaining the manifest will be approximately $108.[5]

RCRA: Land Disposal Bans

RCRA Section 3004(e) limits the wastes that may be disposed of using land disposal. For pesticide formulators, this will mean an increased use of dustbags, enabling pesticide dust to be reused, rather than regulated as a hazardous waste. It is expected that formulators also will move to incineration of wastes, such as mixed pesticide dustbags, and rinsates. At this time there are no studies available as to how these changes in waste disposal practices will affect PFP firms.

Title III of SARA

Sections 302 - 304 of SARA impose requirements for notification, emergency planning, and emergency notification on any facility using, processing, or storing extremely hazardous substances in amounts above the established threshold levels for those substances. EPA has estimated costs per facility for this rule over a three-year period, FY'87 - FY'89. First year costs which include inventory, evaluation, and notification are about $150. Projected costs for the second year, $472.50, are much higher. This assumes that the facility will participate in the development and implementation of the community's Emergency Planning Committee. Third year costs, primarily recordkeeping, are estimated to be about $56.[6] Many PFP firms are complying now with Sections 302 - 304.

Sections 311 and 312 of SARA require businesses to submit Material Safety Data Sheets (MSDS) or alternative lists as well as hazardous chemical inventory forms to three government agencies: the State Emergency Response Commission, the local Emergency Planning Committee, and the local Fire Department. The MSDSs are the same forms already required by the Occupational Health and Safety Administration (OSHA), which establishes the reporting thresholds. Sections 311 requirements were effective on October 15, 1987; Section 312 on March 1, 1988. EPA estimates that the costs to comply with sections 311 and 312 will average $1,000 per facility.[7] These costs will depend upon how many MSDSs are required and whether the MSDSs are supplied by vendors. Most of these costs will not be new, however, because most PFP firms already submit MSDSs for OSHA.

Section 313 requires facilities to complete a toxic chemical release form for each toxic chemical that was manufactured, processed, or otherwise used in quantities exceeding the established toxic chemical threshold quantity during the preceding calendar year. Section 313 applies only to businesses within SIC codes 20 - 39 (manufacturing) and exempts from reporting all facilities with fewer than 10 employees. Section 313 went into effect in June 1987. Toxic chemical release forms are to be submitted annually beginning in 1988. EPA estimates that a small business will have to complete 10 release forms, at a cost of approximately $12,000 in the first year and $9,000 each year thereafter.[8] No information is available to indicate whether these cost estimates are accurate for PFP firms. The 198 small firms in SIC 2879 (59% of the industry) that have fewer than 10 employees would be exempt, of course, from any costs associated with section 313.

Section 322 states that any owner or operator required to submit information pursuant to sections 311, 312, 303(d)(2), 303 (d)(3) or 313 to any other person or agency may withhold the specific chemical identity of a certain hazardous chemical, extremely hazardous substance, or a toxic chemical, if additional requirements are met as defined by the law. The rule requires that owners or operators submit a statement of justification for claiming trade secrecy to the Administrator along with a separate statement revealing the specific identity of the designated chemical or substance. The owner must keep these records on file. EPA estimates that very few PFP firms will be affected by this rule. EPA estimates that this will require 13.3 labor hours per facility at a one-time cost of $450.[9]

Section 323 requires an owner or operator to provide the specific chemical identity of a substance upon the request of a health professional for purposes of diagnosis and treatment of an individual who has been exposed to the substance. This would occur on a case by case basis and EPA has estimated 3.3 hours/year at a cost of $115.50 per facility.[10]

Title III costs are generated primarily by the labor hours associated with paperwork requirements. Therefore paperwork costs are synonymous with the costs stated above.

FIFRA: Farmworkers

EPA is proposing to revise its regulations under FIFRA for protection of agricultural workers from exposure to pesticides. The primary impact of this regulation on PFP firms would be the requirement to make changes on labels of pesticide products. Labels will have to include instructions on the use of the pesticides consistent with the regulations. This might cost $1,000 to $2,000 per label.[11] The regulations may be phased in, however, so that actual costs would be reduced. For instance, the regulations might allow the label changes to be made when the labels are being changed for other reasons.

Paperwork requirements associated with this regulation include reporting, recordkeeping, and data collection. Recordkeeping is expected to require 0.25 hours per week of clerical time to maintain the records, or 6.5 hours per year. Assuming an upper-bound labor cost of $10/hour, the annual cost per firm would be $65.[12]

FIFRA: Pesticides in Ground Water

EPA is considering restricting or canceling, on a case-by-case basis, the use of pesticides that threaten the groundwater, except where management plans for reducing the potential for contamination have been approved. The Agency is meeting with states and others to discuss the issues involved. The potential prevention strategy involves issuing regulations on groundwater monitoring as well as requiring data on and restricting the use, on a regional basis, of pesticides that could leach into the groundwater.

Although the cost of these regulations may be substantial, they apply only to those PFP firms that register their own products, an activity not common to small PFP firms, and then only to those PFP firms that register those pesticides that are designated as posing a hazard to groundwater. PFP firms that sell restricted or cancelled pesticides and not their substitutes may loose market share.

Regulations with an Indirect Impact

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Regulations under the CWA and MPRSA on the ocean dumping of wastes and the incineration of hazardous wastes at sea will also have an impact on waste disposal practices. The list of regulations that fall into this category includes:

RCRA	Subtitle C Location Standards Subtitle D Criteria Liner and Leachate Collection Corrective Action at SWMUs Hazardous Waste Burning Land Ban - Dioxin and Spent Solvents Land Ban - California List Land Ban - First Thirds Land Ban - Soil and Debris Hazardous Waste Tank Standards Toxicity Characteristic
CERCLA	National Contingency Plan CERCLA Settlement Policy
CWA	Ocean Dumping

These regulations will affect PFP firms directly only if they maintain a waste storage, disposal, or treatment facility on their property. For the purposes of this analysis, it is assumed that small PFP firms will find it prohibitive to maintain such facilities and will contract out all of their waste disposal needs. These regulations will affect small PFP firms indirectly, however, by making it more difficult and more expensive for them to dispose of their wastes. As discussed above in reference to the land ban regulations, the costs of waste disposal for PFP firms can be expected to increase. No estimates are available of the likely magnitude of such cost increases.

Regulations with an Uncertain Impact

CWA: National Estuary Program

The National Estuary Program was established in 1987 by sections 317 and 320 of the Water Quality Act. No national program guidance and/or regulations have been developed to define the Comprehensive Conservation and Management Plans (CCMP) which are to be developed by management conferences convened in estuaries of national significance. The impact on PFP firms would depend on the estuaries covered and the pollutant problems of concern. Although it is possible that some small PFP firms might be affected by this program, it is too early to comment on the potential impacts.

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the SDWA. The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, certain activities, such as the loading of pesticides from storage to applicator vehicles, may be banned. This program will affect only those PFP firms that are located near drinking water wells. The number of such firms and the potential impact upon their activities has not yet been determined.

TSCA: Premanufacture Review Program

TSCA requires that chemical manufacturers file a form with EPA giving specific information 90 days before the manufacture or import of a new chemical. The cost is estimated to be between $5,400 to $12,700 per premanufacture notice (PMN).[13]

Only those PFP firms that also manufacture pesticide intermediates would be affected by this regulation. Because the development of new pesticides or new chemicals requires a large investment in research and development, this regulation is most likely to apply to large petroleum, chemical, or pharmaceutical manufacturers and not the smaller PFP operations. Although it is possible that a small PFP firm might decide to enter the market, it is highly improbable. For the purposes of this study, it is assumed that the premanufacture review program will not apply to small businesses.

FIFRA: Reregistration of Pesticides

Pesticides are subject to reexamination as standards change, new data becomes available, etc. Manufacturers may be required to conduct further tests to support the registration. This would have an impact on those PFP firms that also manufacture active ingredients or formulate pesticides.

Individual pesticides may be banned or their use may be restricted. There may be other requirements for the use of specific pesticides, such as special clothing required for application. PFP firms may have to affix new labels to their current inventory. All of these possibilities have some impact on PFP firms. For instance, restricted use pesticides require more recordkeeping.

The costs of reregistration requirements to PFP firms will depend on what actions are taken for which pesticides. These are as yet undetermined.

FIFRA: Inerts

The Inerts Data Call-in requirements of FIFRA require that manufacturers of inerts submit data on the toxicology and related aspects of inert ingredients of pesticide products. The data will be used to assess the acceptability of using specific chemicals as inert ingredients in pesticide products. Users of these products, such as pesticide formulators and packagers, would have to reformulate and relabel pesticides containing banned ingredients. No analyses of the potential impacts of these activities have been prepared.

IMPACT OF THE REGULATIONS

Table C-4 presents a financial profile of small firms in SIC 2879. Over the 1976-1983 period, the median firm in the industry had 12 employees and earned annual net profits of approximately $31,000 on sales of about $700,000 and equity of $265,000. The median firm in the smallest size category (1-9 employees) earned annual net profits of approximately $12,000 on sales of about $270,000 and equity of $47,000.

Table C-5 summarizes the costs of recent and forthcoming environmental regulations for two "typical" PFP firms without wastewater discharges. The smallest PFP firms, those with 1-9 employees, will be exempt from the most costly regulation, Section 313 of SARA Title III, and will have annual costs of only $2,560. These firms should have no difficulty meeting environmental requirements. Larger PFP firms will face costs of $11,560 per year plus increased waste disposal costs and an additional $6,680 in the first year of regulation. They also may have to replace some of their labels at a cost of $1,000-$2,000 each. Although the capital costs are relatively low, the annual costs are about 37% of net profits of the median firm with 10-19 employees and about 200% of the net profits for firms at the lowest quartile level of this size category. These figures suggest that some firms may have difficulty meeting the requirements. Unlike firms in other industries, small PFP firms may have the option of discontinuing some of their operations rather than closing, if they cannot afford to meet these environmental requirements.

CONCLUSION

There is a long list of environmental regulations that will affect PFP firms. Unfortunately, the costs of most are as yet unavailable. The most significant uncertainties have to do with which pesticides will be banned or restricted and how many pesticides will have to be reformulated and/or relabeled. Also undetermined are the pretreatment regulations for PFP firms that discharge waste- waters into municipal sewers. Costs of waste disposal will increase and there will be increased recordkeeping and reporting costs, especially those associated with toxic chemicals.

A comparison of the estimated costs of the environmental regulations with industry financial statistics for 1976-1983 suggests that PFP firms with 10-19 employees could experience some difficulty meeting the increased regulatory costs. Rather than closing their operations entirely, PFP firms that experience such difficulty may discontinue those operations that are covered by the most costly regulations.

Table C-4

FINANCIAL PROFILE: 1976 - 1983
(median values in $1,000)

PESTICIDE AND AGRICULTURAL CHEMICALS
(SIC 2879)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$269	$608	$5,100	$10,986	$55,109	$717
Expenses and Taxes	257	567	4,978	10,719	54,188	686
Net Profit	12	31	122	267	911	31
Assets	110	415	2,345	4,911	20,160	449
Equity	47	197	1,019	2,579	7,926	265
Return on Equity	26%	15%	12%	10%	11%	12%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Table C-5

REGULATORY COSTS FOR TYPICAL SMALL BUSINESSES
in the
THE PESTICIDE FORMULATING AND PACKAGING INDUSTRY
(SIC 2879)

Firm #1: 4 employees, sales = $270,000/yr, net profit = $12,000/yr, equity = $47,000.

Act/Regulation	One-Time Costs	Annual Costs
RCRA: Generators of 100-1,000 kg/mo	$ 3,680	$ 1,560
SARA: Title III 311 & 312	-	$ 1,000
RCRA: Land Disposal Bans	-	increased disposal costs
FIFRA: Farmworkers	$1,000-$2,000/label	
TOTAL COSTS	$3,680 + cost of labels	$2,560 + increased disposal costs

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Firm #2: 12 employees, sales = $700,000/yr, net profit = $30,000/yr, equity = $265,000.

Act/Regulation	One-Time Costs	Annual Costs
RCRA: Generators of 100-1,000 kg/mo	$ 2,120	$ 1,560
SARA: Title III		
311 & 312	-	$ 1,000
313	$ 3,000	$ 9,000
RCRA: Land Disposal Bans,	-	increased disposal costs
FIFRA: Farmworkers	$1,000-$2,000/label	
TOTAL COSTS	$6,680 + cost of labels	$11,560 + increased disposal costs

Appendix D

FARM SUPPLY STORES

Farm supply stores provide needed agricultural products and services to farmers. These businesses are primarily engaged in the wholesale distribution of animal feeds, fertilizers, agricultural chemicals, pesticides, seeds and other farm supplies, except grains. Many farm supply stores also provide fertilizer and/or pesticide application services.

In 1986, there were 15,109 firms primarily engaged in the farm supply industry (SIC 5191). These firms employed 150,486 people and had total sales of approximately $31 billion ($200,000 per employee). Most (58%) of these firms had fewer than 5 employees and 94% and fewer than 20 employees. Only 80 firms had more than 100 employees. Firms with fewer than 20 employees accounted for 46% of industry sales and 44% of industry employment. (See Table D-1.) Employment in farm supply stores actually varies seasonally, with the number of employees often doubling in the spring.

The U.S. Small Business Administration (SBA) classifies as small businesses all firms in SIC 5191 with fewer than 100 employees. Under this definition, all but 80 of the firms (99.5%) in SIC 5191 in 1986 were considered small businesses.

A typical small farm supply store has 3 employees and annual sales of approximately $500,000. Discussions with agricultural county agents and owners of farm supply stores suggest that many of these smaller operations have been ceasing operations in recent years, in part because of the problems and liabilities associated with handling pesticides.[1] Many of the smaller stores still in business, may have ceased pesticide handling and/or application operations.[2]

A survey conducted in 1986 by the publication Farm Store Merchandising showed that only 69% of farm store retailers and distributors sold crop chemicals (herbicides, insecticides, fungicides).[3] Thirty percent of these firms had gross sales of less than $500,000; 20% had sales between $500,000 and $999,999; 22% had sales of $1 million to $1,999,999 and 28% had sales of $2 million or more. This study showed that the percentage of respondents selling crop chemicals varied from 40% for those firms with sales of less than $500,000 to 86% for those firms with sales of $2 million or more. This study also showed that a larger percentage (65%) of the firms with sales of over $2 million offered application services than firms with lower gross sales (47% to 50%).

Table D-1

SMALL BUSINESSES IN THE FARM SUPPLY INDUSTRY - 1986

(SIC 5191)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	8,755	3,964	1,492	683	135
Cumulative Share of:					
Firms	58%	84%	94%	99%	99%
Sales	13%	30%	46%	64%	74%
Employment	15%	32%	44%	57%	63%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

Thus, very small farm supply stores, those with 3 or fewer employees, generally do not formulate or apply pesticides. Today, it would appear that firms with 8 to 10 employees and annual sales of approximately $3 million are probably more typical of small farm supply stores that handle and/or apply pesticides. Many farm supply stores are operated by farmers' cooperatives. These operations have a central location with many individual subordinate outlets. Such cooperatives are generally larger than the typical firms described above.

Practices of farm supply operations vary regionally. Thus in Iowa, most farm supply stores apply pesticides, while those in Georgia and California do not. In California, pesticides are applied by separate application companies. In Georgia, farmers apply their own pesticides unless aerial applications are needed.[4] The Farm Supply Store Merchandising Study showed that, whereas about 66% of the respondents from the New England, Mid-Atlantic, and East and West North Central regions offered application services, only 39% of the respondents from the South Atlantic and East and West South Central regions and 27% from the Mountain and Pacific regions offered these services.

ENVIRONMENTAL PROBLEMS

For farm supply stores that handle pesticides, there are environmental dangers in possible spillage in their use and transportation. For those firms which offer pesticide application services, the mixing and use of these pesticides required stringent handling procedures so as not to contaminate the environment. In addition, those farm supply stores that provide fuels are concerned with potential spills and leaks from underground storage tanks containing gasoline or diesel fuel. The number of farm supply stores that provide fuels is not known, but it appears to be small.

Farm supply stores do not usually formulate pesticides. However, as part of their application operation, they will mix pesticides according to manufacturers' directions for application. Mixing is usually accomplished in open tanks for ease in handling and monitoring. Both wettable powders and liquid formulations from five- to fifty-gallon containers are used. Most applicators use formulations in such a way that they do not generate 100 kilogram per month of hazardous waste.[5] Shaken-out bags and triple rinsed and hole-punched or crushed containers are classified as industrial wastes and can be disposed of in sanitary landfills. However, waste bags or rinsed containers of pesticides classified as acutely hazardous are considered hazardous wastes. There is some difficulty for owners of farm supply operations in determining which of their wastes are classified as acutely hazardous.[6]

ENVIRONMENTAL REGULATIONS

Which environmental regulations affect farm supply stores depends upon whether the stores handle pesticides and/or sell gasoline or diesel fuel. Farm supply stores that handle pesticides will be affected by FIFRA regulations concerning farmworkers and groundwater. For those farm supply stores that also provide petroleum products, the underground storage tank technical standards and financial responsibility requirements will apply. Farm supply stores will also be affected by reporting requirements under Title III of SARA and by restrictions on the land disposal of hazardous wastes. Table D-2 presents a summary of the principal environmental regulations that will affect farm supply stores during the period 1988-1992.

Paperwork requirements for farm supply stores will include initial notification, monitoring, evidence of financial responsibility, and recordkeeping associated with UST's. In addition, they will be required to complete all of the emergency planning, notification, and release reports associated with handling toxic chemicals. The costs incurred by this paperwork burden are presented in Table D-3.

Regulations with a Direct Impact

FIFRA: Farmworkers

EPA is circulating a proposal to substantially revise the federal regulations designed to protect the health and safety of pesticide handlers, including farmworkers performing land labor activities in fields during and after application of pesticides. These regulations provide new requirements for reentry intervals, personal protective clothing, training of workers who handle pesticides, posting of notices in pesticide-treated areas, providing soap, water, and towels for workers, and cholesterase monitoring for commercial applicators of organophosphate pesticides (blood test measurements of pesticide handlers that relate to nerve functioning). The estimated first year costs per establishment for commercial handlers are $8,910. Most of these costs will recur each year.[7] Some part of these costs are already being incurred by commercial applicator firms as a result of regulations promulgated at state and federal levels.

Paperwork requirements associated with this regulation include reporting, recordkeeping, and data collection. Recordkeeping is expected to require 0.25 hours per week of clerical time to maintain the records, or 6.5 hours per year. Assuming an upper-bound labor cost of $10/hour, the annual cost per firm would be $65.[8]

Title III of SARA

Title III regulations set various recordkeeping and reporting requirements for industries depending on the kinds of substances they have on hand and the activites of the facility.

Sections 302 - 304 of SARA impose requirements for notification, emergency planning, and emergency notification on any facility using, processing, or storing extremely hazardous substances in amounts above the established threshold levels for those substances. EPA has estimated costs per facility for this rule over a three-year period, FY'87 - FY'89. First year costs which include inventory, evaluation, and notification are about $150. Projected costs for the second year, $472.50, are much higher. This assumes that the facility will participate in the development and implementation of the community's Emergency Planning Committee. Third year costs, primarily recordkeeping, are estimated to be about $56.[9] Many PFP firms are complying now with Sections 302 - 304.

Sections 311 and 312 of SARA require businesses to submit Material Safety Data Sheets (MSDS) or alternative lists as well as hazardous chemical inventory forms to three government agencies: the State Emergency Response Commission, the local

Table D-2

ENVIRONMENTAL REGULATIONS
for
FARM SUPPLY STORES
(SIC 5191)

Act/Regulation	Requirements	Cost to Small Business	Comments
Direct Impact			
FIFRA: Farmworkers	protective clothing health monitoring	$8,910 first year, $73.51/employee	
SARA: Title III	reporting	$400/yr	Most do now
RCRA: UST Standards	release detection, insurance, and tank upgrade	$500/3-yrs testing, $2,500/yr insurance, $3,000/tank upgrade	Only stores that sell fuels
RCRA: UST Corrective Action	repair or replace leaking UST, clean-up release	may be $100,000+,	15+% of tanks may be leaking
RCRA: Land Disposal Bans	send wastes to haz. disp. sites	increased waste disposal costs	
Indirect Impact			
RCRA: Hazardous Waste Regulations	higher waste disposal costs	undetermined	
Uncertain Impact			
CWA: National Estuary Program	permits and monitoring	undetermined	Only stores near estuaries
SDWA: Wellhead Protection	activity bans near wells	undetermined	Few stores, if any
FIFRA: Pesticides in Groundwater	recordkeeping, restricted use	undetermined	Only selected pesticides
FIFRA: Registration of Pesticides	use restrictions	undetermined	Only selected pesticides
FIFRA: Inerts	solvent bans	undetermined	
TSCA: Premanufacture Review Program	notify EPA of new chemicals	$5,400 to $12,700 per PMN	Only if import new chemicals
RCRA: Generators of 100-1,000 kg/mo	manifest, proper handling	$3,680 initial, $1,560 annual	Most stores exempt

Table D-3

PAPERWORK BURDEN

FARM SUPPLY STORES
(SIC 5191)

Regulation/Activity	One-Time Costs	Annual Costs	Comments
FIFRA: Farmworkers			
Reporting, Recordkeeping		$65	
SARA Title III			
Emergency Planning			
Hazard Evaluation,	$150		1st yr costs
Planning Committee,	$472		2nd yr costs
Recordkeeping		$56	3rd yr costs
Notification of Accidental Releases			Case-specific
Hazardous Chemical Inventory			
Reporting		$1,000	First year only
		$400	Subsequent years
RCRA: UST Standards			
Notification	$15		
Tank Tightness Test Records			Not significant
Financial Assurance Records	$31		
Corrective Action			Site-specific
TOTAL COSTS	**$668**	$1,236	First year costs
		$636	Subsequent years

Emergency Planning Committee, and the local Fire Department. The MSDSs are the same forms already required by the Occupational Health and Safety Adminis-tration (OSHA), which establishes the reporting thresholds. Farm supply stores are required to begin submitting report under Sections 311 and 312 in September, 1988. EPA estimates that the costs to comply with sections 311 and 312 will average $1,000 per facility.[10] These costs will depend upon how many MSDSs are required and whether the MSDSs are supplied by vendors.

EPA considers all of the requirements associated with Title III of SARA to be paperwork requirements. The paperwork costs associated with this regulation, therefore, are the costs estimated above.

RCRA: UST Technical Standards and UST Financial Responsibility

Under EPA's RCRA regulations for underground storage tanks (USTs) that contain petroleum, owners have been required to notify appropriate state authorities as to age, size, construction, location, and contents of their tanks. The proposed technical standards for USTs contain provisions covering general performance standards, release detection, corrosion protection including the upgrading of existing tanks within 10 years, corrective action, closure standards, and reporting and recordkeeping requirements. These regulations will also require meeting financial responsibility requirements. Generally, this will mean obtaining a specified amount of insurance coverage. The final rule is scheduled to be promulgated in July 1988. The requirements will become effective in October 1988, although the effective date of the financial responsibility requirements may be extended to allow certain UST owners and operators time to obtain the required incentive.

These requirements for USTs only apply to those farm supply stores that store chemicals or petroleum products in underground storage tanks. The number of farm supply stores that sell petroleum products varies regionally and there are no estimates on the percentage of stores this might be.

The major costs to a small farm supply store with an underground storage tank for complying with the UST regulations are estimated to be as follows:[12]

Annual Insurance Costs	$ 2,500
Tightness Testing (1x/ 3 yrs)	$ 500
Upgrade Costs (within 10 yrs)	$ 3,000

In addition to these routine costs, farm supply stores with regulated USTs face the possibility that their tanks may be found to be leaking. In this case, they will be required to repair or replace the tank, remove the released solvents from the soil or the groundwater, and repair any other damage to the environment. The cost of such corrective action may be only a few hundred dollars or may be several thousand dollars. EPA estimates that the average clean-up costs for a leaking UST have been approximately $53,000. EPA's experience shows that approximately 15% of all USTs are leaking currently and that an additional 2% can be expected to begin leaking each year.

The paperwork requirements for UST's include notifying EPA, maintaining monitoring records, and submitting reports showing evidence of financial assurance. Existing facilities have submitted the notification form already, a one-time cost of about $15.[13] Because most owners/operators now keep inventory or other tank monitoring records, these requirements will not result in incremental costs. . Filing a record of the required tank tightness test every three years will require approximately 5 minutes and cost about $1.25. The annual cost of showing evidence of financial assurance and maintaining records of financial assurance is estimated to be $31.25[14]

Records must also be kept for tanks that have been upgraded, repaired, or closed. Recordkeeping costs for farm supply stores will vary depending on the number, age, and materials of their existing tanks and whether any leaks have been discovered. In most cases also, filing records will be the only paperwork requirement. If extensive corrective action is required, the owner/operator will have to submit a number of reports, including corrective action plans, progress reports, and a completion notification.

RCRA: Land Disposal Bans

RCRA Section 3004(e) limits the wastes that may be disposed of using land disposal. For farm supply stores that handle pesticides, these restrictions may result in increased costs for disposing of acutely hazardous pesticide wastes. Farm supply stores that sell petroleum products also may experience cost increases associated with waste disposal. The costs or extent of these problems is unknown.

Regulations with an Indirect Impact

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Regulations under the CWA and MPRSA on the ocean dumping of wastes and the incineration of hazardous wastes at sea will also have an impact on waste disposal practices. The list of regulations that fall into this category includes:

RCRA	Subtitle C Location Standards
	Subtitle D Criteria
	Liner and Leachate Collection
	Corrective Action at SWMUs
	Hazardous Waste Burning
	Land Ban - Dioxin and Spent Solvents
	Land Ban - California List
	Land Ban - First Thirds
	Land Ban - Soil and Debris
	Hazardous Waste Tank Standards
	Toxicity Characteristics
CERCLA	National Contingency Plan
	CERCLA Settlement Policy
CWA	Ocean Dumping

These regulations do not affect farm supply stores directly unless they maintain a waste disposal facility on their property. For the purposes of this analysis, it is assumed that small farm supply stores find it prohibitive to maintain such facilities and contract out all of their waste disposal needs. As described under the discussion of land disposal bans above, these regulations may affect small farm supply stores indirectly, however, by making it more difficult and more expensive for them to dispose of their wastes. Thus, the costs of their waste disposal can be expected to increase. Unfortunately, no estimates are available of the likely magnitude of such cost increases.

Regulations with an Uncertain Impact

CWA: National Estuary Program

The National Estuary Program was established in 1987 by sections 317 and 320 of the Water Quality Act. No national program guidance and/or regulations have been developed to define the Comprehensive Conservation and Management Plans (CCMP) which are to be developed by management conferences convened in estuaries of national significance. The impact on farm supply operations would depend on the estuaries covered and the pollutant problems of concern. The elimination of the use of some pesticides in designated estuaries might have some limited impact on pesticide distributors or applicators in the area. It is too early to comment on the potential impacts.

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the SWDA. The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, certain activities, such as the loading of pesticides from storage to applicator vehicles, may be banned. This program will affect only those farm supply firms that operate near drinking water wells. The number of such firms and the potential impact upon their activities has not yet been determined.

FIFRA: Pesticides in Groundwater

EPA is considering restricting or canceling, on a case-by-case basis, the use of pesticides that threaten the groundwater, except where management plans for reducing the potential for contamination have been approved. The Agency is meeting with states and others to discuss the issues involved. The potential prevention strategy involves issuing regulations on groundwater monitoring as well as requiring data on and restricting the use, on a regional basis, of pesticides that could leach into the groundwater.

It would appear that, for farm supply stores, this regulation mainly will involve recordkeeping. It does have the potential, however, to ban or restrict the use of certain pesticides. Farm supply stores could sell substitutes, however. No estimates of the potential costs or impacts of these regulations are available.

FIFRA: Reregistration of Pesticides

Pesticides are subject to reexamination as standards change, new data becomes available, etc. As a result of these activities individual pesticides may be banned or their use may be restricted. There may be other requirements, such a special clothing required for application. The costs to farm supply stores that sell or apply pesticides has not been determined.

FIFRA: Inerts

The Inerts Data Call-in requirements of FIFRA require that manufacturers of inerts submit data on the toxicology and related aspects of inert ingredients of pesticide products. The data will be used to assess the acceptability of using specific chemicals as inert ingredients in pesticide products. Users of these products, such as pesticide applicators, would be affected if certain solvents were banned. Presumedly substitutes would be available, but no analyses of the potential costs or impacts of these activities have been prepared.

TSCA: Premanufacture Review Program

TSCA requires that chemical manufacturers file a form with EPA giving specific information 90 days before the manufacture or import of a new chemical. The cost is estimated to be between $5,400 to $12,700 per premanufacture notice (PMN).[10]

Because TSCA does not apply to pesticides, this regulation would only come into play for those farm supply firms that might import a new chemical to be used in fertilizers or some other non-pesticide use, not a very likely scenario, especially given the potential costs and complications.

RCRA: Generators of 100 to 1,000 kg/mo

The Hazardous and Solid Waste Amendments of 1984 require EPA to regulate generators of hazardous wastes that produce between 100 and 1,000 kilogram per month. The EPA requirements include obtaining an EPA identification number, maintaining a uniform manifest system, installing management controls, and meeting a limited set of performance standards. EPA's final rule was promulgated in March 1986 and became effective September 22, 1986.

EPA estimates that it will cost a small business approximately $3,680[15] to comply with the initial requirements of these regulations and approximately $1,560 per year thereafter.[16] Most farm supply stores do not generate sufficient wastes to come under these regulations. Farm supply stores that apply larger than average quantities of acutely hazardous pesticides might come under this regulation, however.

IMPACT OF THE REGULATIONS

Table D-4 presents a financial profile of farm supply stores over the period 1976-1983. The smallest farm supply stores averaged profits of $20,000 per year over that period on equity of approximately $125,000. The next largest group of farm supply stores, those with 10-19 employees, averaged profits of $44,000 per year on equity of approximately $400,000.

Table D-4

FINANCIAL PROFILE: 1976 - 1983
(median values in $1,000)

FARM SUPPLY STORES
(SIC 5191)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$660	$2,359	$5,453	$12,397	$25,489	$1,274
Expenses and Taxes	640	2,315	5,326	12,156	24,830	1,245
Net Profit	20	44	107	241	659	29
Assets	250	850	2,263	5,146	11,973	395
Equity	125	395	1,019	2,467	6,430	197
Return on Equity	16%	11%	11%	10%	10%	15%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Table D-5 presents the estimated capital and annual costs of current and forthcoming environmental regulations for three typical farm supply stores. A 5-employee farm supply store that does not handle pesticides and does not sell petroleum fuels would have no costs associated with the major regulations. A 15-employee farm supply store that handles pesticides would face increased annual costs of approximately $2,100 and would have first year costs associated with the farmworkers regulation of approximately $9,000. These annual costs amount to approximately 5% of annual net profits. The first year costs amount to about 2% of the average stores' equity. These figures suggest that farm supply stores that do not sell petroleum should be able to meet environmental requirements without difficulty.

A 15-employee farm supply store that sells petroleum fuels would have increased annual costs of approximately $4,765 plus first year and capital costs of approximately $11,900. These annual costs amount to about 11% of annual net profits. The capital and first year costs amount to approximately 3% of equity. Again, these figures suggest that farm supply stores should be able to meet environmental requirements without difficulty.

As discussed above, farm supply stores that store petroleum or chemicals in underground storage tanks, may find that their tanks are leaking. In this event, they would face corrective action costs. If groundwater contamination or other serious damage must be repaired, these corrective action costs could exceed $100,000. These costs could exceed the equity of the smallest farm supply stores that are in less than average financial condition, and could cause them to go out of business.

CONCLUSION

Farm supply stores sell a wide variety of products and perform many different services. Consequently, the environmental regulations that a farm supply store must meet are determined by which products and services the store offers, most notably on whether the store sells or applies pesticides and/or stores petroleum or chemicals in underground storage tanks. Farm supply stores have the option of discontinuing those products or services that entail high environmental costs.

A comparison of the expected costs of environmental regulations with 1976-1983 industry financial statistics, suggests that most farm supply stores will have little difficulty meeting environmental requirements. The major exception to this conclusion is that farm supply stores that face extensive corrective action costs associated with leaking underground storage tanks, may find that the costs are so large they will exhaust their equity and be forced out of business. The percentage of farm supply stores that will face such large costs should be extremely low.

Table D-5

REGULATORY COSTS FOR TYPICAL SMALL BUSINESSES
in the
THE FARM SUPPLY INDUSTRY
(SIC 5191)

Firm #1: 5 employees, sales = $660,000/yr, net profit = $20,000/yr, equity = $125,000. Does not handle pesticides. Does not sell fuels.

Act/Regulation	Capital Costs	Annual Costs
None	-	-

Firm #2: 15 employees, sales = $2.4 million/yr, net profit = $45,000/yr, equity = $400,000. Applies pesticides. Does not sell fuels.

Act/Regulation	Capital Costs	Annual Costs
FIFRA: Farmworkers	$8,910	$1,100
SARA: Title III		$1,000
TOTAL COSTS	$8,910	$2,100

Firm #3: 15 employees, sales = $2.4 million/yr, net profit = $45,000/yr, equity = $400,000. Applies pesticides. Sells fuels.

Act/Regulation	Capital Costs	Annual Costs
FIFRA: Farmworkers	$8,910	$1,100
SARA: Title III		$1,000
RCRA: UST Standards	$3,000/tank	$2,665
TOTAL COSTS	$11,910	$4,765

Appendix E

INTERSTATE TRUCKING

The trucking industry is divided into two segments: local trucking and trucking, except local. Trucking, except local, includes companies that offer "over the road" trucking services outside a single municipal area. For convenience, these companies are termed "interstate" in this study, even though some may not cross state boundaries. Although the environmental problems of all trucking companies are similar, this study focuses on interstate trucking.

In 1986, there were 24,335 firms primarily engaged in interstate trucking (SIC 4213). These firms employed 779,930 people and had total sales of approximately $55 billion ($72,000 per employee). Almost half (44 percent) of these firms had fewer than 5 employees and 92 percent had fewer than 50 employees. Only 962 firms had more than 100 employees. Firms with fewer than 50 employees accounted for 30 percent of industry sales and 25 percent of industry employment. (See Table E-1.)

The U.S. Small Business Administration (SBA) classifies as small businesses all firms in SIC 4213 with annual sales less than $12.5 million. In 1986 firms in SIC 4213 with 100-249 employees had average annual sales of $10.4 million and firms with 250-499 employees had average annual sales of $22.4 million. Thus, most interstate trucking companies with less than 250 employees (approximately 98.6% of the industry) would have been considered small businesses.

The trucking industry is divided into three size classes by annual sales:

Class I - greater than $5 million
Class II - from $1 million to $5 million
Class III - less than $1 million

A "high side" Class III firm, with sales approaching $1 million, would have 10 to 12 trucks, 20-25 employees, and no terminals.[1] Most Class III firms would be much smaller than that. A typical small business in the interstate trucking industry in 1986, had six employees and annual sales of approximately $500,000. Such a firm would have operated out of a single suburban location using five trucks. The upper range of Class II firms would own 50 trucks and employ approximately 100 people.[2] All would have a home base and many would perform their own maintenance, but few would have terminals. A considerable number would have an underground storage tank (UST) storing diesel fuel or gasoline. A Class I firm would buy fuel in bulk, necessitating self-storage, and would have at least one UST for diesel fuel and might have more than one; it might also have a gasoline UST for smaller trucks that use gasoline.

Table E-1

SMALL BUSINESSES IN THE INTERSTATE TRUCKING INDUSTRY

(SIC 4213)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	10,757	4,711	3,736	3,070	1,099
Cumulative Share of:					
Firms	44%	64%	79%	92%	96%
Sales	4%	9%	17%	30%	40%
Employment	3%	7%	13%	25%	34%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

ENVIRONMENTAL PROBLEMS

Environmental concerns associated with the trucking industry include potential spills and leaks from underground storage tanks containing diesel fuel or used oil. If a trucking operation performs its own maintenance, then it uses solvents for degreasing parts. Waste disposal problems would involve used oil and spent cleaning solvents. The used oil might be put into underground storage tanks or into drums. The washing of trucks is done with chemicals and steam cleaning, creating wastewater runoff. For a tank truck, the "heel," or what is left in the tank after draining the previous haul, must be steamcleaned out and perhaps handled as a hazardous waste. Both Class I and Class II firms would likely have these cleaning functions performed by outside services.

Gasoline and diesel fuel handling operations, emissions, and controls are divided into two steps: the filling of the underground storage tank (Stage I) and vehicle refueling (Stage II). Stage I emissions can be reduced by about 95 percent by the use of a vapor balance system, in which the vapors are transferred in the tank truck unloading at the service stations and then to the terminal vapor processor for recovery or destruction. Instead of being vented to the atmosphere, the vapors are transferred into the tank truck unloading at the gasoline tank and, ultimately, to the terminal vapor processor for recovery or destruction. Such controls have been incorporated into many state regulations.

Vehicle refueling emissions from spillage and from vapor displaced from the vehicle by dispensed fuel are another major source of emissions. Stage II controls on fuel pumps are currently being used in 26 counties in California and the District of Columbia and are being considered for other ozone nonattainment areas.

Tank trucks with vapor collection equipment can become a separate source of emissions when leakage occurs (estimated to average about 30 percent of potentially captured emissions). Many states require gasoline tank trucks equipped for vapor collection to pass an annual test of tank vapor tightness and pressure limits for the tanks and vapor collection equipment (reducing average leakage to about 10 percent).

Contaminants are introduced in used oil through use, mixing, or mismanagement. Engine use of lubricating oils produces contaminated used oils through the internal chemical breakdown of additives during service and through such external factors as engine blowby, dust, and dirt. In addition, used oil may be mixed either knowingly or unknowingly with hazardous wastes and thus become contaminated. For example, chlorinated solvents, such as degreasing solvents, are frequently introduced into used oil storage tanks. The preferred, and more common, practice is to store the spent solvents in separate storage drums.

ENVIRONMENTAL REGULATIONS

The principal environmental regulations that will affect the interstate trucking industry during the period 1988-1992 are those are intended to secure the underground storage of fuel and correct any damage caused by leaks, reduce air emissions during pumping, and control the disposal of hazardous wastes. These are summarized in Table E-2.

Table E-2

ENVIRONMENTAL REGULATIONS
for the
THE INTERSTATE TRUCKING INDUSTRY
(SIC 4213)

Act/Regulation	Requirements	Cost to Small Business	Comments
Direct Impact			
SARA: Title III	recordkeeping and reporting	$400/yr; $1,000 first year	
RCRA: UST Standards	insurance, tightness testing, upgrade tank	$2,500/yr $500/3-yr/tank $3,000/tank	No Class III, some Class II, all Class I
RCRA: UST Corrective Action	repair/replace leaking tanks, clean-up releases	may be $100,000+, depends upon damage from leak	15+% of tanks may be leaking
RCRA: Waste Oil Management	recordkeeping, repair leaks	$100/yr plus costs of repairs	Options still to be decided
Indirect Impact			
CAA: Heavy-Duty Diesel Particulates	none	higher engine prices	
CAA: Diesel Fuel Standards	none	higher fuel prices, reduced maintenance	
CAA: Fuel Volatility	none	higher fuel prices	
CWA: Oil and Gas ELG	none	higher fuel prices	
RCRA: Hazardous Waste Regulations		higher waste disposal costs	
Uncertain Impact			
CAA: Gas Marketing	new nozzles	$2,000-$4,000 capital $300 annual	Only DC, CA, St. Louis
CWA: Machinery ELG	undetermined	undetermined	
SDWA: Wellhead Protection	activity bans near wells	undetermined	May apply to few firms
TSCA: Chlorinated Solvents	undetermined	undetermined	

Paperwork requirements for trucking firms will include initial notification, monitoring, evidence of financial responsibility, and recordkeeping associated with UST's. In addition, they will be required to complete all the notification and reporting forms associated with handling hazardous substances and used oil.
The costs associated with meeting these paperwork requirements are presented in Table E-3.

Regulations with a Direct Impact

Title III of SARA

Sections 311 and 312 of SARA require businesses to submit Material Safety Data Sheets (MSDS) or alternative lists as well as hazardous chemical inventory forms to three government agencies: the State Emergency Response Commission, the local Emergency Planning Committee, and the local Fire Department. The MSDSs are the same forms already required by the Occupational Health and Safety Adminis-tration (OSHA), which establishes the reporting thresholds. Sections 311 requirements were effective on October 15, 1987; Section 312 on March 1, 1988. EPA estimates that the costs to comply with sections 311 and 312 will average $1,000 per facility for the first year and about $400 in succeeding years.[3] These costs will depend upon how many MSDSs are required and whether the MSDSs are supplied by vendors. Trucking firms that use solvents or other hazardous chemicals will be required to comply with this rule.

EPA considers all of the requirements associated with Title III of SARA to be paperwork requirements. The paperwork costs associated with this regulation, therefore, are the costs estimated above.

RCRA: UST Technical Standards and UST Financial Responsibility

Under EPA's RCRA regulations for underground storage tanks (USTs) that contain petroleum, owners have been required to notify appropriate state authorities as to age, size, construction, location, and contents of their tanks. The proposed standards for USTs contain general performance standards as well as requirements for release detection, installation and maintenance of corrosion protection, closure, and reporting and recordkeeping. Existing tanks are to be upgraded to new tank standards within 10 years. These regulations will also require meeting financial responsibility requirements. Generally, this will mean obtaining a specified amount of insurance coverage. The final rule is scheduled to be promulgated in July 1988. The requirements will become effective in October 1988, although the effective date of the financial responsibility requirements may be extended to allow certain UST owners and operators time to obtain the required insurance.

Few trucking firms in the smallest classification, Class III, would have USTs, but a considerable number in the Classes I and II category would. The major costs for complying with the UST regulations are estimated to be as follows:[4]

Annual Insurance Costs	$ 2,500
Tank Testing (1x/3 yrs)	$ 500/tank
Tank Upgrade (within 10 yrs)	$ 3,000/tank

Table E-3

PAPERWORK BURDEN

INTERSTATE TRUCKING
(SIC 4213)

Regulation/Activity	One-Time Costs	Annual Costs	Comments
SARA Title III			
Hazardous Chemical Inventory		$1,000	First year only
Inventory		$400	Subsequent years
UST Standards			
Notification	$15		
Tank Tightness Test Records			Not significant
Financial Assurance Records	$31		
Corrective Action			Site-specific
Waste Oil Mgmt			
Notification	$15		Firms generating used oil
Recordkeeping		$22	
TOTAL COSTS	$61	$1,022	First year
		$422	Subsequent years

In addition to these routine costs, firms with regulated USTs face the possibility that their tanks may be found to be leaking. In this case, they will be required to repair or replace the tank, remove the released solvents from the soil or the groundwater, and repair any other damage to the environment. The cost of such corrective action may be only a few hundred dollars or may be several thousand dollars. EPA estimates that the average clean-up costs for a leaking UST have been approximately $53,000. EPA's experience shows that approximately 15 percent of all USTs are leaking currently and that an additional 2 percent can be expected to begin leaking each year.[5]

The paperwork requirements for UST's include notifying EPA, maintaining monitoring records, and submitting reports showing evidence of financial assurance. Existing facilities have submitted the notification form already, a one-time cost of about $15.[6] Because most owners/operators now keep inventory or other tank monitoring records, these requirements will not result in incremental costs. Filing a record of the required tank tightness test every three years will require approximately 5 minutes and cost about $1.25. The annual cost of showing evidence of financial assurance and maintaining records of financial assurance is estimated to be $31.25[7]

Records must also be kept for tanks that have been upgraded, repaired, or closed. Recordkeeping costs for gasoline service stations will vary depending on the number, age, and materials of their existing tanks and whether any leaks have been discovered. In most cases also, filing records will be the only paperwork requirement. If extensive corrective action is required, the owner/operator will have to submit a number of reports, including corrective action plans, progress reports, and a completion notification.

RCRA: Waste Oil Management

Trucking firms may accumulate and sell used oil to be rerefined or burned as fuel. EPA decided in November 1986 not to regulate used oil destined for recycling as a hazardous waste due to the deleterious effect on recycling. EPA is examining a range of RCRA, TSCA, and other options regarding used oil disposal. The legislative mandate for waste oil management regulations is section 3012 of RCRA, added to the statute by the Used Oil Recycling Act of 1980 and amended (and re-designated as section 3014) by the 1984 RCRA amendments. The statute provides a special niche for recycled oil in Subtitle C that differs from all other wastes. Recycled oil is to be regulated under a special set of rules, effects on recycling must be taken into account in listing and regulating recycled oil, and EPA retains authority to regulate recycled oil under Subtitle C whether or not it is identified or listed as hazardous.

EPA announced (51 FR 41900) that it intends to issue recycled oil management standards under Section 3014 of RCRA and that it will determine whether used oil being disposed of (not recycled) should be listed as a RCRA hazardous waste.

In the past, most trucking firms would sell the used oil that they accumulated to collectors, who in turn would sell the used oil to refining facilities for re-refining or to other parties for burning in industrial boilers. Collectors would pick up used oil in trucks and generally pay between 10 and 30 cents per gallon. As the price of oil has declined, this practice has been declining as well, so that used oil is no longer such a marketable commodity.

The costs that trucking firms would incur under EPA's used oil regulations will depend upon the regulatory strategy that EPA chooses. One of the options that EPA has been considering would require firm operators to obtain an EPA identification number, maintain an internal log of waste oil pickups, and meet UST technical standards and financial responsibility requirements for any USTs containing used oil. EPA estimated the cost of these used oil requirements to be approximately $100 per year plus the cost of meeting UST requirements described above. Should trucking companies be required to meet the more stringent standards associated with hazardous waste tanks and hazardous waste management, the costs of the used oil regulations would be considerably greater.

Presently, paperwork activities associated with used oil management for trucking firms requires notification, recordkeeping, and tracking of shipments using a manifest system. However, because of the controversy over EPA's decision not to list used oil as a hazardous waste, the current standards may change. All trucking firms that generate used oil are now required to notify EPA one time to receive an EPA identification number. This is estimated to take 1 hour and cost the facility $15.[8] Trucking firms that recycle used oil will not have to obtain individual permits. Collection logs and recordkeeping impose annual paperwork burdens. Trucking firms are required to track used oil shipments using invoices (i.e., collection logs), so that used oil goes only to legitimate outlets and allowing EPA to trace problems to their sources. The burden of collection logs largely falls on recycling companies, many of whom currently use invoices that meet the regulatory requirements. Maintaining a collection log is estimated to take 5 minutes per event and to cost about $22 per year for a typical generator.

Regulations with an Indirect Impact

CAA: Heavy-Duty Diesel Particulates

The Heavy-Duty Diesel Particulate regulation established emission standards for oxides of nitrogen emissions and particulate emissions from heavy-duty diesel engines. New NO_x standards were finalized for the 1988 model year for light-duty trucks and heavy-duty engines and again in the 1991 model year for heavy-duty engines. New particulate standards for heavy-duty engines were finalized for the 1988, 1991, and 1994 model years. The 1988 NO_x standards have been delayed until 1990 for all but the lighter end of the light-duty truck class. Direct costs apply to manufacturers but small businesses that use these products will likely have increased costs of purchase of new trucks and engines.

CAA: Diesel Fuel Standards

The Diesel Fuel Standard regulation is aimed at refiners. EPA is evaluating the need to propose a diesel fuel sulfur standard of about 0.05 percent by weight and an aromatics standard of about 20 percent by volume. The schedule of implementation is under study. Indirect impacts on users of diesel fuels are expected assuming some increased costs in refiners meeting standards will increase the cost of fuel. Only No. 2 diesel fuel will be affected. The ATA estimates truckers' fuel costs will increase 1 to 3 cents per gallon. Increased costs of fuel may be somewhat offset by decreased maintenance costs and increased engine life. A positive impact of this regulation is that it will reduce the costs for engine manufacturers to meet the 1991 and 1994 heavy-duty engine particulate standards, thus ameliorating the particulate standard's impact on the trucking industry.

CAA: Fuel Volatility

Refiners must reduce the Reid Vapor Pressure of gasoline in ASTM Class C areas to 10.5 psi in 1989 and to 9.0 psi in 1992, thus reducing butane content. Proportional reductions apply to other areas. Nationwide refinery costs of about $447 million per year would be offset by savings to the consumer of about $294 million per year due to increased fuel energy density and the recovery of evaporative emissions. Including a small vehicle cost increase, the net cost to the consumer would be about $157 million per year, or under $20 per vehicle over its lifetime.

CWA: Oil and Gas Effluent Guidelines

The oil and gas extraction industry onshore segment stripper subcategory will be subject to regulations establishing effluent limitations and guidelines. Trucking companies could be affected indirectly by this regulation with an increase in the cost of oil and gasoline. The proposal is planned for 1991 with promulgation in 1993.

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Regulations under the CWA and MPRSA on the ocean dumping of wastes and the incineration of hazardous wastes at sea will also have an impact on waste disposal practices. The list of regulations that fall into this category includes:

RCRA	Subtitle C Location Standards Subtitle D Criteria Liner and Leachate Collection Corrective Action at SWMUs Hazardous Waste Burning Land Ban - Dioxin and Spent Solvents Land Ban - California List Land Ban - First Thirds Land Ban - Soil and Debris Hazardous Waste Tank Standards Toxicity Characteristics
CERCLA	National Contingency Plan CERCLA Settlement Policy
CWA	Ocean Dumping

These regulations would affect interstate trucking firms directly only if they maintain a waste storage, disposal, or treatment facility on their property. This is highly unlikely. The regulations will affect trucking firms indirectly, however, by making it more difficult and more expensive for them to dispose of their wastes.

Thus, the costs of their waste disposal can be expected to increase. Unfortunately, no estimates are available of the likely magnitude of such cost increases.

Regulations with an Uncertain Impact

CAA: Gas Marketing

The Gas Marketing regulation is intended to reduce emissions from gasoline marketing operations of benzene, ethylene dibromide (EDB), ethylene dichloride (EDC), and gasoline vapors. The focus is on gasoline vapors, or volatile organic compounds, as precursors to ozone formation, since these emissions contribute to failure to attain the national ambient air quality standard for ozone in some areas. The regulation was prompted by the need to revise state implementation plans for 11 air control regions, pursuant to Section 110(a)(1) of the Clean Air Act.

The two regulatory strategies are (1) control systems on gasoline pumping equipment (Stage II controls) and (2) control systems on vehicles and trucks (onboard controls). Onboard controls are the subject of Section 202(a)(b) of the Clean Air Act, and proposed rules for these controls were announced in the August 19, 1987 Federal Register.

Stage II controls consist of either vapor balance systems or assisted systems.[9] Assisted systems use a variety of means to generate a negative or zero pressure differential at the nozzle-vehicle interface so that a tight seal is not necessary between the vehicle and the nozzle boot, a flexible covering over the nozzle which captures the vapor for return to the underground tank via a vapor hose. Onboard vapor controls consist of a fillpipe seal and a carbon canister that adsorbs the vapors displaced from the vehicle fuel tank by the incoming gasoline. The technology is an extension of a system already installed on light-duty cars and trucks. Since 1971, new cars have been equipped with similar carbon canister systems for collecting evaporative emissions (breathing losses caused by temperature changes in the vehicle tank and carburetor).

EPA has estimated that the costs to install the necessary Stage II control systems would be $5,000 to $10,000 for a gasoline service station with 6-9 pumps. Annual maintenance costs would be approximately $600 per year.[10] The costs to a trucking company with fewer pumps would be proportionately less. Few or no Class III trucking companies would have their own fuel storage, but a considerable number of Class II firms would.

Currently, EPA proposes to limit Stage II controls to the areas in California and the District of Columbia, where they are already in place, and to the St. Louis metropolitan area. Thus, as currently proposed, this regulation will not affect the vast majority of interstate trucking companies.

CWA: Machinery Manufacturing and Rebuilding

Possible effluent limitation guidelines for the machinery manufacturing, rebuilding, and maintenance industry are the subject of a new EPA industry study. The effect on small businesses depends on the depth and breadth of the regulation and the extent to which water is used in the process. A decision document to determine the regulatory approach, if any, will be prepared in fiscal year 1988.

Thus, a description of requirements cannot be given. Some requirements for trucking firms might be limitations on truck washing, maintenance and fueling, grease traps, and shop drains.

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the Safe Drinking Water Act (SDWA). The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified, and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, certain activities, such as the transfer of petroleum products from tank farms to public or private gas stations, may be banned. This program will affect only those trucking firms are located near drinking water wells. The number of such firms and the potential impact upon their activities has not yet been determined.

TSCA: Chlorinated Solvents

The regulatory options for metal cleaning with chlorinated solvents have not yet been finalized, but it is expected that they will include ambient controls and occupational controls. Gas stations and presumably trucking firms, too, use outside services to dispose of their solvents. Many trucking firms use methylene chloride and petroleum solvents in repair and maintenance.

IMPACT OF THE REGULATIONS

Table E-4 presents a financial profile of the interstate trucking industry for 1983.* The median firm in 1983 had sales of $770,000, net profits of $24,000, and equity of $140,000. The median firm with $1,000,000 in sales would have had profits of approximately $30,000. A median trucking firm in the smallest category (1-9 employees) had sales of about $325,000, net profits of $13,000, and equity of about $90,000.

Table E-5 summarizes the costs of environmental regulations for trucking companies of various sizes. The smallest companies do not perform their own maintenance and have no underground storage tanks. These companies would not have any direct costs associated with the environmental regulations included in this study. Companies that perform maintenance would have annual costs of approximately $500 and additional first year costs of approximately $600 associated with the waste oil regulations and the reporting requirements under SARA Title III. These annual costs would amount to less than 3% of annual net profits. The additional first year costs would amount to less than 1% of the median firm's equity. Larger companies that also have an underground storage tank would have to upgrade their tank, obtain insurance, and test their tank every three years. Their total annual environmental costs would be approximately $3,200 and their capital costs

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* Statistics are presented for 1983 rather than for the 1976-1983 period, because the industry showed a steady trend of rising sales and equity over the period, so that figures for 1983 are substantially higher than the average for the period.

Table E-4

FINANCIAL PROFILE: 1983
(median values, in $1,000)

INTERSTATE TRUCKING
(SIC 4213)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$326	$697	$1,606	$3,733	$11,446	$819
Expenses and Taxes	313	679	1,561	3,584	11,322	795
Net Profit	13	18	45	149	124	24
Assets	178	327	664	1,345	5,439	332
Equity	89	121	226	430	1,262	140
Return on Equity	14%	15%	20%	35%	10%	17%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Table E-5

REGULATORY COSTS FOR TYPICAL SMALL BUSINESSES
in the
THE INTERSTATE TRUCKING INDUSTRY
(SIC 4213)

Firm #1: 5 employees, sales = $325,000/yr, net profit = $13,000/yr, equity = $90,000. No maintenance. No underground storage tank.

Act/Regulation	Capital Costs	Annual Costs
None	-	-

Firm #2: 13 employees, sales = $700,000/yr, net profit = $18,000/yr, equity = $120,000. Performs maintenance. No underground storage tank.

Act/Regulation	Capital Costs	Annual Costs
SARA: Title III	$ 600	$ 400
RCRA: Waste Oil	-	$ 100
TOTAL COSTS	$ 600	$ 500

Firm #3: 27 employees, sales = $1.6 million/yr, net profit = $45,000/yr, equity = $225,000. Performs maintenance. One underground storage tank.

Act/Regulation	Capital Costs	Annual Costs
SARA: Title III	$ 600	$ 400
RCRA: UST Standards	$3,000	$2,665
RCRA: Waste Oil	-	$ 100
TOTAL COSTS	$3,600	$3,165

about $3,600. These costs would amount to about 7% and 1.5% of their annual net profits and equity, respectively. These figures all suggest that interstate trucking firms should have no difficulty meeting the environmental requirements included in this study.

Firms that find that their underground tanks have been leaking could face much higher costs, however, possibly exceeding $100,000. EPA's experience to date indicates that 15 percent to 20 percent of the underground tanks may be leaking. It is possible that some of these firms with leaking USTs may be unable to afford the required corrective actions. This is likely to be a very small portion of the industry, however.

CONCLUSION

The principal environmental regulations that will affect the interstate trucking industry directly during the 1988-1992 period will apply only to those firms that store petroleum fuels on their premises or store waste oils in underground storage tanks. These are generally only the larger trucking companies. The other environmental regulations that will affect the interstate trucking industry will do so indirectly, increasing the price of trucks, fuel, or waste disposal.

A comparison of the expected costs of environmental regulations with 1983 industry financial statistics, suggests that most interstate trucking companies will have little difficulty meeting environmental requirements. The major exception is that trucking companies that face extensive corrective action costs associated with leaking underground storage tanks may find that the costs are so large they will exhaust their equity and be forced out of business. The percentage of interstate trucking companies that will face such large costs should be extremely low.

Appendix F

GASOLINE SERVICE STATIONS

The retail marketing of gasoline is performed at various types of business outlets, including gasoline service stations, convenience stores, marinas, car washes, and agricultural cooperatives. In 1984, approximately 90,000 firms owned approximately 193,000 retail motor fuel outlets. The owners of these outlets ranged from some of the largest corporations in the United States (Exxon, Mobil Oil, etc.) to very small businesses with no reported payroll. Approximately 59,000 of the retail outlets were leased to different business entities by their owners.

The types of businesses that own and operate retail gasoline marketing outlets are defined below.

> Refiners are large, vertically integrated oil companies with refineries that produce petroleum products that are distributed through the companies' wholesale and retail "branded" outlets;
>
> Jobbers are primarily wholesalers of petroleum products that also may own retail service stations or convenience store outlets;
>
> Convenience stores are chains of retail stores that sell gasoline in addition to grocery and other products;
>
> Independent chain marketers are owners of chains of retail gasoline marketing outlets that often sell "unbranded" or private brand petroleum products;
>
> Open dealers are individuals who both own and operate their gasoline marketing operations, usually at single-site locations; and
>
> Lessee dealers are individuals who operate outlets under lease arrangements, generally with refiners, jobbers, or independent chains.

Table F-1 presents statistics on the number of retail gasoline marketing outlets owned, operated, and leased by these different types of businesses.

Table F-1

OWNERSHIP AND OPERATION OF GASOLINE MARKETING OUTLETS

Segment	Number of Firms	Number of Retail Outlets Owned and Operated	Number of Retail Outlets Owned and Leased	Total Number of Retail Outlets Owned
Refiners	27	9,964	36,817	46,781
Jobbers	8,766	25,333	20,713	46,046
Convenience Stores[1]	516	14,732	0	14,732
Independent Chains[2]	125	4,010	1,127	5,137
Open Dealers	80,304	80,304	0	80,304
TOTAL	89,738	134,343	58,657	193,000

Source: Meridian Research, Inc., Financial Responsibility for Underground Storage Tanks: Financial Profile of the Retail Motor Fuel Marketing Industry Sector, Draft Final Report, April 1987.

1. Convenience store owners are defined to exclude jobbers.

2. Independent chains are defined to exclude jobbers and convenience store owners.

The basis for classifying firms in standard industrial classification (SIC) 5541 is that they receive more than 50 percent of their revenues from the sale of gasoline and related products (e.g., lubricating oil). Thus, firms in this SIC classification include both firms that own and firms that only operate gasoline outlets. Using SIC 5541 data, there are approximately 49,453 firms in the gasoline service station industry. Table F-2 presents a distribution of these firms by employment-size category. It shows that 52 percent of these firms had fewer than five employees in 1986 and 94 percent had fewer than 20 employees. In the same year, firms with fewer than 20 employees accounted for 49 percent of industry sales and 56 percent of industry employment. Table F-3 presents a financial profile of firms in SIC 5541. It shows that the typical small firm in 1983 (a firm with 19 or fewer employees) had sales of $600,000 to $2 million and profits of $10,000 to $30,000 in 1983.

Small businesses in SIC 5541 include firms that own and operate their own retail gasoline outlets, firms that lease the outlets they operate, and a limited number of firms that only lease outlets to others. Firms that both own and operate their own outlets will bear the full impact of all environmental regulations affecting retail gasoline outlets.

Small businesses in the retail gasoline marketing sector are defined by the Small Business Administration as firms with less than $4.5 million in annual sales. All firms in the open dealer segment and some firms in the convenience store and independent chain segments are small businesses. Small firms own approximately 88,780, or 46 percent, of all retail gasoline outlets. In addition, all firms leasing retail gasoline outlets are small businesses.

Analyzing potential impacts on lessee dealers is especially difficult because although these dealers are themselves small businesses operating only a single outlet, the firms from which they lease their outlets--refiners (62.8 percent), jobbers (35.3 percent) and independent chains (1.9 percent)--are all large businesses. It is thus often not clear whether the owner or the lessee will bear the burden of regulatory costs. In normal practice, the owner is contractually responsible for capital investments and property-related expenditures such as corrective action; the lessee, however, is usually responsible for routine operating expenditures. Because of the uncertainties concerning impacts on lessee dealers, this chapter will focus on firms that both own and operate retail motor fuel outlets.

Table F-4 presents a distribution of total assets for all firms owning retail gasoline outlets, i.e., all of the firms that will have to bear the full costs of forthcoming EPA regulations. It shows that 93.6 percent of these firms have less than $600,001 in total assets. The median firm has assets between $200,000 and $400,000, while the median outlet is owned by a firm with assets in the $600,000 to $1 million range.

Table F-2

SMALL BUSINESSES IN THE GASOLINE SERVICE STATION INDUSTRY - 1986

(SIC 5541)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	25,589	15,586	5,467	1,873	543
Cumulative Share of:					
Firms	52%	83%	94%	98%	99%
Sales	14%	34%	49%	63%	72%
Employment	17%	40%	56%	68%	77%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

Table F-3

FINANCIAL PROFILE - 1983

(median values in $1,000)

GASOLINE SERVICE STATIONS

(SIC 5541)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$640	$2,000	$4,796	$10,875	$29,000	$1,203
Expenses and Taxes	631	1,976	4,781	10,762	28,928	1,188
Net Profit	9	24	15	113	72	15
Assets	137	235	717	1,220	5,858	212
Equity	85	89	303	332	1,829	121
Return on Equity	10%	26%	5%	34%	4%	12%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Table F-4

DISTRIBUTION OF TOTAL ASSETS AMONG FIRMS OWNING RETAIL GASOLINE MARKETING OUTLETS

Total Assets	Number of Firms in This Group		Number of Outlets Owned by Firms in This Group	
0-$200,000	30,114	(33.56)[1]	30,114	(15.60)
$200,001-$400,000	33,410	(37.23)	36,705	(19.02)
$400,001-$600,000	20,478	(22.82)	21,684	(11.24)
$600,001-$1,000,000	3,567	(3.97)	14,268	(7.39)
$1,000,001-$10,000,000	2,063	(2.30)	28,722	(14.88)
$10,000,001-$100,000,000	76	(0.08)	9.572	(4.96)
$100,000,001-$1,000,000,000	4	(0.00004)	2,562	(1.33)
1,000,000,000 +	27	(0.03)	49,371	(25.58)
TOTAL	89,738[2]		193,000	

Source: Meridian Research, Inc., Financial Responsibility for Underground Storage Tanks: Financial Profile of the Retail Motor Fuel Marketing Industry Sector, Draft Final Report, April 1987.

[1]. Numbers in parentheses are percentages of all firms or all outlets in this sector represented by the firms in this asset group.

2. Columns may not total because of rounding; percentages are calculated for the rounded total.

Table F-5 illustrates the distribution of net income to total asset ratios (i.e., rate of return on assets) for all of the firms that own retail gasoline outlets. This ratio can be used to characterize a firm's financial health or profitability. The lower a firm's return on assets, the greater the likelihood that the firm will fail or decide to close its outlets. The median rate of return on assets for these firms is between 6 percent and 8 percent, which is a fairly typical return on assets for U.S. firms (except for U.S. firms engaged in banking or financial services).

This rate of return indicates that firms in the retail gasoline marketing sector are, on average, neither more nor less profitable than firms engaged in most other lines of business. Most of the return on assets categories shown in Table F-5 include both large and small firms, although a large convenience store chain is the only firm represented in the negative return on assets category. The second lowest category (0-0.02) includes both single-outlet open dealers and the Texaco Corporation, while the highest rate of return category (0.08+) includes both the Exxon Corporation and many single-outlet open dealers. These data show that small firms owning retail gasoline marketing outlets are no less profitable on a percentage rate of return basis than large firms. Environmental regulations may affect large and small firms quite differently, however, because small firms have much less revenue to cover environmental costs that are often almost as high for them as for the large firms.

ENVIRONMENTAL PROBLEMS

Environmental concerns at retail gasoline outlets include potential spills and leaks from underground storage tanks containing gasoline, diesel fuel, and/or used oil, and vapor emissions from the handling of gasoline. Waste disposal problems at retail gasoline outlets involve used oil and spent cleaning solvents.

Gasoline handling operations are divided into two steps: the filling of an underground storage tank (Stage I) and vehicle refueling (Stage II). Stage I emissions can be reduced by about 95 percent through the use of a vapor balance system, which transfers fuel vapors into the tank truck unloading at the outlet and then to the terminal vapor processor for recovery or destruction, instead of venting them to the atmosphere. Requirements for such controls have been incorporated into many state regulations.

Tank trucks with vapor collection equipment can become a separate source of emissions when leakage (estimated to average about 30 percent of potentially captured emissions) occurs. Many states require gasoline tank trucks equipped for vapor collection to pass an annual test of tank vapor tightness and pressure limits for the tanks and vapor collection equipment. Meeting these requirements reduces average leakage to about 10 percent.

Vehicle refueling emissions from spillage and from vapor displaced from vehicles by dispensed gasoline are another major source of emissions.

Table F-5

DISTRIBUTION OF NET INCOME TO TOTAL ASSETS RATIOS AMONG FIRMS OWNING RETAIL GASOLINE MARKETING OUTLETS

Ratio of Net Income to Total Assets	Number of Firms in This Group	Number of Outlets Owned by Firms in This Group
Less than 0	1 (0)[1]	185 (0.10)
0-0.02	30,573 (34.07)	48,801 (25.29)
0.02-0.04	1,540 (1.72)	25,891 (13.42)
0.04-0.06	6,941 (7.73)	45,840 (23.75)
0.06-0.08	30,590 (34.09)	42,054 (21.79)
0.08+	20,094 (22.39)	30,225 (15.66)
TOTAL	89,738[2]	193,000

Source: Meridian Research, Inc., Financial Responsibility for Underground Storage Tanks: Financial Profile of the Retail Motor Fuel Marketing Industry Sector, Draft Final Report, April 1987.

1. Numbers in parentheses are percentages of the total population of outlets or firms in this net income to total assets category.

2. Columns may not total because of rounding; percentages are calculated for the rounded total.

Stage II controls are currently being used in 26 counties in California and the District of Columbia and are being considered for other ozone nonattainment areas.

Contaminants are introduced into used oil through use, mixing, or mismanagement. Automotive use of lubricating oils produces contaminated used oils through the internal chemical breakdown of additives during service and through such external factors as engine blowby, dust, and dirt. This oil contains large quantities of lead and lower levels of barium, arsenic, and cadmium. In addition, used oil may be mixed either knowingly or unknowingly with hazardous wastes and thus become contaminated. For example, chlorinated solvents such as degreasing solvents are frequently introduced into automotive used oil storage tanks. The preferred, and more common, practice is to store the spent solvents in separate storage drums.

ENVIRONMENTAL REGULATIONS

The principal environmental regulations that will affect gasoline service stations between 1988 and 1992 are the technical standards and financial responsibility requirements for owners and operators of underground storage tanks (USTs) and the regulations governing the handling and disposal of used oil. In addition gasoline service stations in certain air quality nonattainment areas (e.g. St. Louis) will be required to install air emission controls on the nozzles of their gasoline pump hoses. Other EPA regulations that may affect retail gasoline outlets include regulations pertaining to used oil, hazardous wastes, and toxic chemicals.

Paperwork requirements for gasoline service stations will include initial notification, monitoring, evidence of financial responsibility, and recordkeeping associated with UST's. In addition, they will be required to complete all the notification, manifest and reporting forms associated with handling hazardous substances and used oil. The costs associated with meeting these paperwork requirements are presented in Table F-6.

Regulations with a Direct Impact

CAA: Gasoline Marketing

EPA's gasoline marketing regulations are intended to reduce emissions of benzene, ethylene dibromide (EDB), ethylene dichloride (EDC), and gasoline vapors. The focus is on gasoline vapors, or volatile organic compounds, because these emissions contribute to the failure of some geographical areas to attain the national ambient air quality standard for ozone. The regulation was prompted by the need to revise state implementation plans for 11 air control regions, pursuant to Section 110(a)(1) of the Clean Air Act.

Two regulatory strategies are being considered: (1) control systems on vehicles and trucks (onboard controls), and (2) control systems on service station equipment (stage II controls). Onboard controls are the subject of Section 2020(a)(b) of the Clean Air Act, and proposed rules for these controls were announced in the August 19, 1987 Federal Register.

Stage II controls consist of either vapor balance systems or assisted systems.

Table F-6

PAPERWORK BURDEN

GASOLINE SERVICE STATIONS
(SIC 5541)

Regulation/Activity	One-Time Costs	Annual Costs	Comments
RCRA: UST Standards			
Notification	$15		
Tank Tightness Test Records			Not significant
Financial Assurance Records	$31		
Corrective Action			Site-specific
RCRA: Waste Oil Mgmt			
Notification	$15		Stations generating used oil
Recordkeeping		$22	
RCRA: Generators of 100 to 1,000 kg/mo			
Notification	$25		
Manifest			Done by contractor
Recordkeeping		$20	
SARA Title III			
Hazardous Chemical Inventory		$1,000	First year only
		$400	Subsequent years
TOTAL COSTS	$86	$1,042	First year
		$442	Subsequent years

Assisted systems use a variety of means to generate a negative or zero pressure differential at the nozzle-vehicle interface so that a tight seal is not necessary between the vehicle and the nozzle boot, which is a flexible covering over the nozzle that captures the vapor for return to the underground tank via a vapor hose. Onboard vapor controls consist of a fillpipe seal and a carbon canister that adsorbs the vapors displaced from the vehicle fuel tank by the incoming gasoline. The technology is an extension of a system already installed on light-duty cars and trucks. Since 1971, new cars have been equipped with similar carbon canister systems for collecting evaporative emissions (breathing losses caused by temperature changes in the vehicle tank and carburetor). EPA's August 1987 proposal limited the application of stage II controls to selected nonattainment areas (e.g. St. Louis). Thus, these regulations will not affect most gasoline service stations.

RCRA: UST Technical Standards

EPA's technical standards for underground storage tanks will include regulations for new and existing tanks containing petroleum and hazardous substances. These standards may be applied to tanks containing used oil as well. EPA's proposed technical standards for new and existing tanks contains provisions covering release detection, general technical requirements (e.g., performance standards for new USTs, operation and maintenance of corrosion protection for new and existing USTs), mandatory upgrading of existing USTs, closure, corrective action, reporting and recordkeeping. These regulations should become final in July 1988.

RCRA: UST Financial Responsibility Requirements

EPA's financial responsibility requirements for owners and operators of underground storage tanks require UST owners or operators to demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases from their USTs. Owners and operators are permitted to use one, or a combination, of the following mechanisms to demonstrate financial responsibility: financial tests of self-insurance, guarantees, insurance (including risk retention group coverage), surety bonds, letters of credit, State-required mechanisms, and State funds (or other State assurance). Financial responsibility must be demonstrated in the amount of at least $1 million per occurrence and in an aggregate amount that depends on the number of USTs assured. One to 16 USTs must be assured at the $1 million aggregate level; 17 or more USTs must be assured at the $2 million aggregate level. UST owners and operators who are unable to provide financial assurance by the effective date of the regulations may apply for a suspension of enforcement while they attempt to form risk retention groups or obtain assurance from a State corrective action and compensation program. These regulations may be changed prior to promulgation in July 1988 and the effective date may be extended to allow certain UST owner and operators time to obtain the required insurance.

The paperwork requirements for UST's include notifying EPA, maintaining monitoring records, and submitting reports showing evidence of financial assurance. Existing facilities have submitted the notification form already, a one-time cost of about $15.[1] Because most owners/operators now keep inventory or other tank monitoring records, these requirements will not result in incremental costs. Filing a record of the required tank tightness test every three years will require approximately 5 minutes and cost about $1.25. The annual cost of showing evidence of financial assurance and maintaining records of financial assurance is estimated to be $31.25[2]

Records must also be kept for tanks that have been upgraded, repaired, or closed. Recordkeeping costs for gasoline service stations will vary depending on the number, age, and materials of their existing tanks and whether any leaks have been discovered. In most cases also, filing records will be the only paperwork requirement. If extensive corrective action is required, the owner/operator will have to submit a number of reports, including corrective action plans, progress reports, and a completion notification.

RCRA: Waste Oil Management

Gasoline service stations may accumulate and sell used oil to be rerefined or burned as fuel. EPA decided in November 1986 not to regulate used oil destined for recycling as a hazardous waste due to the deleterious effect on recycling. EPA is examining a range of RCRA, TSCA, and other options regarding used oil disposal. The legislative mandate for waste oil management regulations is section 3012 of RCRA, added to the statute by the Used Oil Recycling Act of 1980 and amended (and re-designated as section 3014) by the 1984 RCRA amendments. The statute provides a special niche for recycled oil in Subtitle C that differs from all other wastes. Recycled oil is to be regulated under a special set of rules, effects on recycling must be taken into account in listing and regulating recycled oil, and EPA retains authority to regulate recycled oil under Subtitle C whether or not it is identified or listed as hazardous.

EPA announced (51 FR 41900) that it intends to issue recycled oil management standards under Section 3014 of RCRA and that it will determine whether used oil being disposed of (not recycled) should be listed as a RCRA hazardous waste. Furthermore, EPA may require that underground tanks used to store used oil meet the UST standards discussed above. In the preamble to the proposed UST technical standards, EPA explained:

> The Agency is assessing whether the regulations that are proposed today would be appropriate for used oil UST systems.... EPA may determine that the technical standards being proposed today are appropriate for used oil tanks, in which case, EPA may apply today's technical standards to used oil in the final rule (52 FR 12689, April 17, 1987).

In the past, most service stations would sell the used oil that they accumulated to collectors, who in turn would sell it to refining facilities for re-refining or to other parties for burning in industrial boilers. Collectors would pick up used oil in trucks and generally pay between 10 and 30 cents per gallon. As the price of oil has declined, this practice has been declining as well, so that used oil is no longer such a marketable commodity.

The costs that gasoline stations would incur under EPA's waste oil regulations will depend upon the regulatory strategy that EPA chooses. One of the options that EPA has been considering would require service station operators to obtain an EPA identification number, maintain an internal log of waste oil pickups, and meet

UST technical standards and financial responsibility requirements for any USTs containing waste oil. EPA estimates the cost of these requirements to be approximately $100 per year plus the cost of meeting UST requirements described above. Should gasoline stations be required to meet the more stringent standards associated with hazardous waste tanks and hazardous waste management, the costs of the waste oil regulations would be considerably greater.

Presently, paperwork activities associated with waste oil management for gasoline service stations require notification, recordkeeping, and tracking of shipments using a manifest system. However, because of the controversy over EPA's decision not to list used oil as a hazardous waste, the current standards may change.

All gasoline service stations that generate used oil are now required to notify EPA one time to receive an EPA identification number. This is estimated to take 1 hour and cost the facility $15.[3] Gasoline stations that recycle used oil will not have to obtain individual permits. Collection logs and record- keeping impose annual paperwork burdens. Gasoline stations are required to track used oil shipments using invoices (i.e., collection logs), so that used oil goes only to legitimate outlets, allowing EPA to trace problems to their sources. The burden of collection logs largely falls on recycling companies, many of whom currently use invoices that meet the regulatory requirements. Maintaining a collection log is estimated to take 5 minutes per event and to cost about $22 per year for a typical generator.

RCRA: Generators of 100 to 1,000 kg/mo

The Hazardous and Solid Waste Amendments of 1984 require EPA to regulate generators of hazardous wastes that produce between 100 and 1000 kilogram per month. The EPA requirements include obtaining an EPA identification number, maintaining a uniform manifest system, installing management controls, and meeting a limited set of performance standards. EPA's final rule was promulgated in March 1986 and became effective September 22, 1986.

Gasoline service stations will be required to comply with these regulations, if they generate between 100 and 1,000 kilograms of spent solvents per month. EPA estimates that it will cost a small business approximately $3,680[4] to comply with the initial requirements of these regulations. The annual cost of compliance for service stations depends on the frequency of the Safety Kleen pick-up service which amounts to about $50 each time. The range is once every month to once every 9 weeks or about $300 to $600 per year.[5]

The paperwork burdens associated with this regulation include a one-time requirement to obtain an EPA identification number and annual recordkeeping requirements associated with the manifest system. EPA estimates that the cost of obtaining the identification number is approximately $25[6] and the annual cost of maintaining the records for the manifest is approximately $20.[7]

Title III of SARA

Sections 311 and 312 of SARA require businesses to submit Material Safety Data Sheets (MSDS) or alternative lists as well as hazardous chemical inventory forms to three government agencies: the State Emergency Response Commission, the local Emergency Planning Committee, and the local Fire Department. The MSDSs are the same forms already required by the Occupational Health and Safety Administration (OSHA), which establishes the reporting thresholds. Section 311 requirements are effective September 1988; Section 312 becomes effective March 1989. EPA estimates that the costs to comply with sections 311 and 312 will average $1,000 per facility for the first year and about $400 in succeeding years.[8] These costs will depend upon how many MSDSs are required and whether the MSDSs are supplied by vendors. Most service stations use solvents or other hazardous chemicals and will be required to comply with this rule.

EPA considers all of the requirements associated with Title III of SARA to be paperwork requirements. The paperwork costs associated with this regulation, therefore, are the costs estimated above.

Regulations with an Indirect Impact

CAA: Fuel Volatility

Refiners must reduce the Reid Vapor Pressure of gasoline in ASTM Class C areas to 10.5 psi in 1989 and to 9.0 psi in 1992, thus reducing butane content. Proportional reductions apply to other areas. A small vehicle cost of $20/car over its lifetime is expected, and it is presumed that higher costs for gasoline will impact slightly on all businesses that use gasoline.

CWA: Oil and Gas Effluent Guidelines

The oil and gas extraction industry onshore segment stripper subcategory will be subject to regulations establishing effluent limitations and guidelines. Gasoline service stations could be impacted indirectly by this regulation with an increase in the cost of oil and gasoline. The proposal is planned for 1991 with promulgation in 1993.

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Forthcoming regulations under the CWA and MPRSA on the ocean dumping of wastes and the incineration of hazardous wastes at sea will also have an impact on waste disposal practices. The list of forthcoming regulations that fall into this category includes:

RCRA
- Subtitle C Location Standards
- Subtitle D Criteria
- Liner and Leachate Collection
- Corrective Action at SWMUs
- Hazardous Waste Burning
- Land Ban - Dioxin and Spent Solvents
- Land Ban - California List
- Land Ban - First Thirds

Land Ban - Soil and Debris
Hazardous Waste Tank Standards
Toxicity Characteristics

CERCLA National Contingency Plan
CERCLA Settlement Policy

CWA Ocean Dumping

These regulations would affect gasoline service stations firms directly only if they maintain a waste storage, disposal, or treatment facility on their property. This is highly unlikely. The regulations will affect service stations indirectly, however, by making it more difficult and more expensive for them to dispose of their wastes. Thus, the costs of their waste disposal can be expected to increase. Unfortunately, no estimates are available of the likely magnitude of such cost increases.

Regulations with an Uncertain Impact

CWA: Machinery Manufacturing Effluent Guidelines

Possible effluent limitation guidelines for the machinery manufacturing, rebuilding, and maintenance industry are the subject of a new EPA industry study. The effect on small businesses depends on the depth and breadth of the regulation and the extent to which water is used in the process. A decision document to determine the regulatory approach, if any, will be prepared in fiscal year 1988. Thus, a description of requirements cannot be given.

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the SWDA. The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, certain activities, such as the transfer of petroleum products from tank farms to gas stations may be banned. This program will affect only those service stations that are located near drinking water wells. The number of such firms and the potential impact upon their activities has not yet been determined.

IMPACT OF THE REGULATIONS

This section describes the impacts of the regulations described above on a typical small business in the retail gasoline marketing sector, a median open dealer. For the median open dealer, assets are $210,000, net annual income is $14,000, and net worth is $90,000.

UST Technical Requirements

The underground storage tank technical standards differ from many regulations in that they cannot be summarized as a one-time capital cost followed by constant annual operating costs. There is no cost of these requirements that must be incurred in every year. Under the proposed standards, which may change prior to promulgation, tank testing must be conducted every three years. Other requirements depend upon the condition of the UST or have timing that is at the discretion of the owner or operator. Whether tanks must be replaced or corrective action expenditures incurred depends upon the condition of the UST. The owner or operator is allowed ten years to upgrade tanks and, in most cases, can meet upgrading requirements by retrofitting existing tanks rather than by replacing them. Because of the nature of these requirements, the potential impacts are best analyzed as a series of possible activities that may occur at a gasoline service station. The costs of different compliance activities related to UST technical requirements are summarized in Table F-7.

Routine monitoring. Testing three tanks has an after-tax cost of $1,275. This reduces the rate of return on assets for the typical open dealer to approximately 6 percent, which is still a good rate of return. The impact of testing will be somewhat reduced by the fact that these costs are incurred only once every three years.

Tank upgrading. Upgrading one tank has an after-tax cost of $2,593. This reduces the rate of return of the median open dealer to about 5.5 percent. Thus, even in the year in which a tank is upgraded, it is possible for such a firm to finance this activity out of profits and still retain at least a fair rate of return. Under the proposed rule, a dealer with three tanks need not upgrade a tank more frequently than once every three years to meet the 10-year regulatory deadline.

A non-plume release. As Table F-7 shows, the expected value of the after-tax cost of leak verification and corrective action for a non-plume release is $19,635. This alone would absorb more than the annual net income of the median open dealer. Such a corrective action would therefore leave the median open dealer in poor financial condition (-2.7 percent rate of return).

A small plume release. As Table F-7 shows, the expected value of the after-tax cost of leak verification and corrective action for an average small plume release (i.e., one less than 25 square meters in area) is $31,620 if only a floating plume must be cleaned up and $53,720 if a dispersed plume must also be cleaned up. Paying these costs would leave the median open dealer in severe financial distress (-8.4 percent rate of return). The additional costs of cleaning up a dispersed plume are nearly four times the annual net income of the median open dealer. These costs would leave the median open dealer in severe financial distress (-18.9 percent rate of return).

A large plume release. As Table F-7 shows, an average large plume release (i.e., one greater than 25 square meters in area) has an expected value in after-tax leak verification and corrective action costs of $108,545 (although the pre-tax costs of $127,700 may again be a more appropriate measure because of the size of the loss). These after-tax costs alone are equal to nearly eight years' of net income for the median open dealer. This is clearly enough to cause the median open dealer to fail.

Table F-7

IMPACTS ON MEDIAN DEALER'S PROFITABILITY OF SELECTED COMPLIANCE ACTIVITIES AND EVENTS

	Cost of Action	
Activity/Event	Before Tax	Adjusted [1]
Test Three Tanks	$ 1,500	$ 1,275
Upgrade One Tank	$ 3,050	$ 2,593
Non-Plume Release with Leak Verification, and Corrective Action	$ 23,100	$ 19,635
Small Plume Release with Clean-up of Floating Plume, Leak Verification, and Corrective Action	$ 37,200	$ 31,620 [2]
Large Plume Release, Leak Verification, and Corrective Action	$127,700	$108,545

Source: Meridian Research, Inc., using the Affordability model.

[1] Adjustment is based on Cost X (1-TR), where marginal corporate tax rate, TR, is estimated to be 15 percent. Where losses are made, it is assumed that the deduction will be carried over, since costs do not recur annually.

[2] Cost of new tank ($6,000) is reduced by 10 percent income tax credit prior to adjustments for tax described in note.

UST Financial Responsibility Requirements

Open dealers will not be able to use the majority of the financial assurance mechanisms proposed by EPA to satisfy their financial responsibility requirements. These dealers will not be able to meet the financial test of self-insurance or to qualify for letters of credit or surety bonds, and other private assurance mechanisms will generally be unavailable to firms of this size. At this time, public mechanisms such as State funds are not available. Firms that are not able to obtain a financial assurance mechanism may apply for a suspension of enforcement.

The only private mechanism potentially available to open dealers is pollution liability insurance. In the past, such insurance has not been sold to single-site operations in the retail gasoline marketing industry. If such insurance were available, however, EPA estimates that it would cost approximately $2,500 per outlet annually. (See EPA's Regulatory Impact Analysis of Proposed Financial Responsibility Requirements for Underground Storage Tanks Containing Petroleum).

EPA estimates that the cost of UST insurance would cause 0.7 percent of small business-owned retail gasoline outlets to close annually as a result of paying the costs of insurance premiums. However, over the long run (10 years), fewer firms would exit the industry if they had UST insurance than if they did not. The costs of insurance premiums may force some low-profit, marginal open dealer firms to close. However, among larger, more profitable open dealer firms and small business chains, fewer outlets would close because of paying insurance premiums than would close as a result of meeting the costs of their UST-related corrective action and third-party liability awards from their own funds.

The financial responsibility regulations may also accelerate the costs associated with the technical requirements. The technical requirements allow 3 years for initial monitoring and 10 years for upgrading tanks. However, some insurers may require monitoring data and upgrading of USTs in order to obtain insurance. As a result, costs that would have been incurred over the next ten years for the technical standards may have to be incurred within a single year in order to obtain insurance. On the other hand, once insurance is obtained, it will cover the costs of any corrective actions that may occur, and will thus minimize the potential for economic disruption associated with these events. Currently, there are no state compensation and liability funds that fully meet Subtitle I's requirements for use as a financial responsibility mechanism. The extent to which such programs mitigate economic impacts depends on how they are set up. At one extreme, a fund that paid for all corrective actions and provided low-interest loans to small businesses for tank replacement and that was based on a gasoline tax would virtually eliminate the economic impacts on small businesses of the technical standards. At the other extreme, a fund based on tank fees and that paid only corrective action costs for financially insolvent UST owners or operators would do nothing to mitigate the economic impacts of these standards on small businesses.

In summary, unless the availability of insurance and types of firms able to obtain it alter greatly, insurance will not significantly mitigate small business economic impacts. State compensation and liability funds may mitigate the economic impacts of the technical standards, but it is uncertain whether such funds will come into being and whether they will be designed in a way that permits them to mitigate economic impacts.

Gasoline Marketing Regulations

EPA has estimated that the costs of stage II vapor recovery system for a gasoline service station with 6 to 8 nozzles. Such a system would have capital costs of $12,600 and annual operating costs of $890 per year. The capital costs would reduce the median open dealers' income from $14,000 to $500 if the costs could not be recovered through increased revenues. These costs would temporarily force the firm into a marginal financial condition. Firms with lower profits than the median open dealer would be tempted to close as the result of such expenditures. The annual costs of this regulation would have a relatively minor impact on the net income of the median open dealer even if he is unable to recover these costs through increased revenues.

As discussed above, these costs will apply only to stations in selected air quality nonattainment areas (i.e. California, Washington, D.C., and St. Louis). Because California and Washington, D.C. already have stage II controls installed, the incremental costs of these regulations will be felt only in St. Louis.

Other Regulations

The combined annual costs of the regulations covering waste oil, generators of 100 to 1,000 kg/mo of hazardous wastes, and SARA Title III will be approximately $1,000 per year. These costs would have a minor impact on the net income of the median open dealer.

CONCLUSION

Table F-8 summarizes the impacts of selected compliance activities upon the average gasoline service station. As can be seen, the impact of the regulations will depend mostly upon the status of the stations' USTs. The cleanup of even small releases could place the average station in a poor or distressed financial condition. The cleanup of large plume releases could result in the average station's failure.

The costs associated with a corrective action, particularly if there is a plume or if the tank must be replaced, will lead to severe economic impacts. In many cases, these events will cause the bankruptcy of small businesses in the retail gasoline marketing sector. Fortunately, not all firms will incur corrective actions, and some states may use state funds to aid small firms in meeting the costs of corrective action. The capital investments required by all standards considered here can be sustained by most small firms if they are allowed several years to make the expenditures. If, however, all capital expenditures under all regulations must be met in a two- to three-year period, only the strongest firms are likely to survive.

Table F-8

IMPACTS OF SELECTED COMPLIANCE ACTIVITIES UPON THE AVERAGE GASOLINE SERVICE STATION

Activity/Event	Net Income ($)	Net Income/Assets (%)	Financial Condition
Test Three Tanks	$12,725	6.06%	Good
Upgrade One Tank	$11,407	5.43%	Good
Nonplume Release with leak verification and corrective action	$ -5,635	-2.68%	Poor
Small Plume Release with cleanup of floating plume, leak verification, and corrective action	$-17,620	-8.39%	Severe Distress
Large Plume Release with cleanup of floating plume, leak verification, and corrective action	$-94,545	-45.02%	Failure

Appendix G

DRY CLEANING

The dry cleaning industry is engaged in the cleaning, pressing, and finishing of garments and apparel. It is divided into three sectors: commercial (SIC 7216), coin-operated (SIC 7215), and industrial (SIC 7218). Commercial facilities are the stores popularly referred to as "dry cleaners". Plants in the coin-operated sector are usually part of a laundromat. They provide inexpensive dry cleaning that does not include pressing or other finishes. The industrial sector supplies laundered uniforms, wiping towels, work gloves, etc. to industrial or commercial users. For industrial dry cleaners, dry cleaning is a supplemental process applied to only about 10 percent of their laundry items. The remainder of this chapter focuses on commercial dry cleaners.

In 1986, there were 15,251 firms primarily engaged in the commercial dry cleaning industry (SIC 7216). These firms employed 140,793 people and had total sales of approximately $3 billion ($24,000 per employee). Almost half (46%) of these firms had fewer than 5 employees and 91% had fewer than 20 employees. Only 91 firms had more than 100 employees. Firms with fewer than 20 employees accounted for 56% of industry sales and 59% of industry employment. (see Table G-1).

The U.S. Small Business Administration (SBA) classifies as small businesses all firms in SIC 7216 with annual sales less than $2.5 million. In 1986, dry cleaners with 50-99 employees had average sales of $1.5 million and dry cleaners with 100-249 employees had average sales of $3.4 million. Thus, most dry cleaners with fewer than 100 employees (99.4% of the industry) would be considered small businesses.

A typical small dry cleaner has 3-5 employees and annual sales of approximately $100,000. Such a firm cleans 50,000 pounds of clothing each year, operating out of a single urban location with one 30 pound dry cleaning machine.

ENVIRONMENTAL PROBLEMS

Most of the environmental problems in the dry cleaning industry are related to dry cleaning solvents. Over the years there has been a pronounced trend away from the use of petroleum-based solvents and toward the use of perchloroethylene. Over 84% of all dry cleaning facilities use perchloroethylene.[1] Most of the remaining facilities use a petroleum-based solvent and a small percentage use either fluorocarbon or trichloromethane. Environmental problems are created by the evaporation of these solvents and by the presence of these solvents in wastewaters and solid wastes. Spent solvents and wastes contaminated by solvents are considered hazardous.

Table G-1

SMALL BUSINESSES IN THE DRY CLEANING INDUSTRY - 1986

(SIC 7216)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	6,983	4,503	2,390	1,059	225
Cumulative Share of:					
Firms	46%	75%	91%	98%	99%
Sales	15%	36%	56%	78%	89%
Employment	14%	35%	57%	78%	88%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

Many firms in the dry cleaning industry already have taken steps to reduce solvent emissions and solvent contaminated wastes. The use of perchloroethylene by the dry cleaning industry has been declining and is expected to continue to decrease slowly due to greater recycling and lower solvent emissions from equipment. The economic incentive for self-imposed emission reductions and solvent recycling have persuaded plants to install control devices and/or switch to more efficient machines voluntarily.

Another trend in the commercial dry cleaning industry is the increased use of dry-to-dry machines as opposed to transfer machines. Transfer machines are those which consist of separate units for cleaning and drying that require manual transfer from the cleaning to the drying unit. Dry-to-dry machines accomplish both cleaning and drying in one machine, thereby eliminating solvent emissions from the transfer process.

With few exceptions, most commercial dry cleaners use distillation and/or filtration techniques to regenerate their solvents. The wastes produced by these processes consist of spent filter cartridges, thick liquid still bottoms, and/or muck-containing dry filter powder. Typically, a dry cleaner will generate 50-60 pounds of such wastes per 1,000 pounds of clothing cleaned.[2] Thus, a small business that processes 50,000 pounds of clothing each year will generate approximately 3,000 pounds of solvent-containing wastes, or about 110 kilograms of such wastes each month.

Most dry cleaners have contracts with a single national service company, Safety-Kleen, to provide disposal drums for their solvent-related wastes, pick-up and dispose of these wastes, and carry out all manifesting requirements except generator signature. Approximately five percent of commercial dry cleaners do not use Safety-Kleen's services, either because they are in remote areas or for other reasons dispose of their own wastes.

ENVIRONMENTAL REGULATIONS

The principal environmental regulations that will affect dry cleaners during the 1988-1992 period will be those that control the evaporation of perchloro- ethylene from perc dry cleaning machines, restrict the handling and disposal of hazardous wastes, and require the reporting of toxic chemicals stored on premises. Dry cleaners that use petroleum solvents will not be subject to the perchloroethylene air emission standards, but may be subject to EPA's requirements for underground storage tanks. Dry cleaners also will be affected indirectly by a series of EPA regulations that will impose stricter standards on waste disposal in general, and hazardous waste disposal in particular.[3] The forthcoming EPA regulations that will affect dry cleaners are described in more detail below and are summarized in Table G-2.

Paperwork requirements for dry cleaners will include initial notification, monitoring, evidence of financial responsibility, and recordkeeping associated with UST's. In addition, they will be required to complete all the notification, manifest and reporting forms associated with handling hazardous substances and spent solvents. The costs associated with meeting these paperwork requirements are presented in Table G-3.

Table G-2

ENVIRONMENTAL REGULATIONS
for the
THE DRY CLEANING INDUSTRY
(SIC 7216)

Act/Regulation	Requirements	Cost to Small Business	Comments
Direct Impact			
CAA: Perc Dry Cleaner NESHAP	ambient controls or machinery replacement	$6,500 for controls $28,000 to replace	50% installed. Options still to be decided.
SARA: Title III	recordkeeping, reporting	$1,000 first year, $400/yr thereafter	Vendor may supply forms
RCRA: Generators of 100-1,000 kg/mo	manifest, proper handling	$50 per month, plus $3,680 first year	Contract services
RCRA: UST Standards	insurance, tightness testing, upgrade tank	$2,500/yr $500/3-yr/tank $3,000/tank	Portion of industry.
RCRA: UST Corrective Action	repair/replace leaking tanks, clean-up releases	may be $100,000+, depends upon damage from leak	15+% of tanks may be leaking.
Indirect Impact			
RCRA: Hazardous Waste Regulations	higher waste disposal costs	undetermined	Only one company providing service.
Uncertain Impact			
SDWA: Wellhead Protection	activity bans near drinking water wells	undetermined	May apply to few firms, if any.

Table G-3

PAPERWORK BURDEN

DRY CLEANERS
(SIC 5541)

Regulation/Activity	One-Time Costs	Annual Costs	Comments
UST Standards			
Notification	$30		
Tank Tightness Test Records			Not significant
Financial Assurance Records	$31		
Corrective Action			Site-specific
Small Quantity Generators			
Notification	$63		
Manifest			Done by contractor
Recordkeeping		$20	
SARA Title III			
Hazardous Chemical Inventory		$1,000 $400	First year only Subsequent years
TOTAL COSTS	$124	$1,020 $420	First year Subsequent years

Regulations with a Direct Impact

CAA: Perc Dry Cleaners NESHAP
TSCA: Chlorinated Solvents

An interagency regulatory group, the Chlorinated Solvents Project, is investigating regulatory options for the dry cleaning industry. This interagency group consists of representatives from EPA, FDA, OSHA, and The Consumer Products Safety Commission (CPSC). Options for health risk management in the commercial sector of the dry cleaning industry consist of methods for reducing emissions from chlorinated solvents from dry cleaning machines.[4] Various alternatives are based on three different emission control techniques: requiring dry cleaners to switch from transfer to dry-to-dry machines; requiring ambient controls (refrigerated condensers and carbon adsorbers) on all machines, and requiring that worker controls (leak detection and repair methods and local exhaust systems) be placed on all machines. The alternatives may include one or a combination of the three control techniques. Viable alternatives depend on the permissable exposure limit (PEL) that might be established by OSHA regulations. Also under study is the consumers exposure to solvents.

The addition of ambient controls (refrigerated condensers and carbon adsorbers) on both transfer and dry-to-dry machines is one possibility for controlling emissions. Another option under consideration is the banning of transfer machines. According to one study, approximately 50 percent of commercial dry cleaners have installed ambient controls already. Some of these plants have installed emission reducing equipment voluntarily, but the majority are regulated through state and/or local restrictions.

The capital costs of installing controls on most commercial dry-to-dry perc dry cleaning machines (15 lb. to 45 lb.) would be about $6,800 for a carbon adsorber and $6,300 for a refrigerated condenser. The capital costs of installing a refrigerated condenser on a transfer machine would be higher, about $8,400. Annual costs would increase more with the installation of a carbon absorber, approximately $1,800/yr. for a 30 lb. machine, than with the installation of a refrigerated condenser, approximately $475/yr.[5]

If transfer machines are banned, the costs of the regulations to those dry cleaners currently operating such machines will be much higher than the cost of installing ambient controls. Replacing a 35-lb transfer machine with a 35-lb dry-to-dry unit with a built-in refrigerated condenser would cost approximately $28,000.[6]

The Chlorinated Solvents Project is still considering the issues involved in this regulation and comparing the available options. No regulatory decisions have been made.

RCRA: Generators of 100 to 1000 kg/mo

The Hazardous and Solid Waste Amendments of 1984 require EPA to regulate generators of hazardous wastes that produce between 100 and 1000 kilogram per month. The EPA requirements include obtaining an EPA identification number, maintaining a uniform manifest system, installing management controls, and meeting a limited set of performance standards. Dry cleaners are subject to container regulations that require covers over buckets where spent cartridges, filter sludge, and still bottoms are temporarily stored. EPA's final rule was promulgated in March 1986 and became effective September 22, 1986.

EPA estimates that it will cost a small business approximately $3,680[7] to comply with the initial requirements of these regulations. The cost of compliance for dry cleaners is included in Safety Kleen's $50 monthly service charge.

The paperwork burdens associated with this regulation include a one-time requirement to obtain an EPA identification number and annual recordkeeping requirements associated with the manifest system. EPA estimates that the cost of obtaining the identification number for these facilities is approximately $25.[8] The annual cost of maintaining the records for the manifest is approximately $20.[9]

Title III of SARA

Sections 311 and 312 of SARA require businesses to submit Material Safety Data Sheets (MSDS) or alternative lists as well as hazardous chemical inventory forms to three government agencies: the State Emergency Response Commission, the local Emergency Planning Committee, and the local Fire Department. The MSDSs are the same forms already required by the Occupational Health and Safety Adminis-tration (OSHA), which establishes the reporting thresholds. Under EPA's regulations, businesses with more than 10,000 pounds of designated materials on hand will be required to submit MSDS's by September 1988. Most dry cleaners have tanks containing more than 1,250 gallons of solvent and would fall under these requirements. EPA estimates that the costs to comply with sections 311 and 312 will average $1,000 per facility for the first year and $400 per year thereafter.[10] If solvent suppliers provide completed MSDS forms, however, the costs could be substantially less.

EPA considers all of the requirements associated with Title III of SARA to be paperwork requirements. The paperwork costs associated with this regulation, therefore, are the costs estimated above.

RCRA: UST Technical Standards and UST Financial Responsibility

Under EPA's RCRA regulations for underground storage tanks (USTs) that contain petroleum or chemicals*, owners have been required to notify appropriate state authorities as to age, size, construction, location, and contents of their tanks. The proposed technical standards cover general performance, release detection, operation and maintenance of corrosion protection, closure, and recordkeeping and reporting. Existing tanks must be upgraded to new tank standards within 10 years. The proposed regulations also require meeting financial responsibility requirements. Generally, this will mean obtaining a specified amount of insurance coverage. The final rule is scheduled to be promulgated in July 1988. The requirements will become effective in October 1988, although the effective date of the financial responsibility requirements may be extended to allow certain UST owners and operators time to obtain the required insurance.

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*Should dry cleaning solvents be designated hazardous, then dry cleaners will have to meet much stricter and more expensive standards for USTs.

These requirements for USTs only apply to those dry cleaners that store their solvents in underground storage tanks. Generally, this is the practice only of dry cleaners that use petroleum solvents. Because dry cleaners using petroleum solvents are usually smaller than average, it is possible that they account for a much greater percentage of firms than they do of production volume (14%). One source has suggested that up to 50% of dry cleaning facilities may be using petroleum solvents.

The major costs to a small dry cleaner for complying with the UST regulations are estimated to be as follows:[11]

Insurance	$ 2,500/year
Tightness Testing (1x/3 yrs)	$ 500/tank
Tank Upgrade (within 10 yrs)	$ 3,000/tank

In addition to these routine costs, dry cleaners with regulated USTs face the possibility that their tanks may be found to be leaking. In this case, they will be required to repair or replace the tank, remove the released solvents from the soil or the groundwater, and repair any other damage to the environment. The cost of such corrective action may be only a few hundred dollars or may be several thousand dollars. EPA estimates that the average clean-up costs for a leaking gasoline service station UST have been approximately $53,000. EPA's experience shows that approximately 15% of all USTs are leaking currently and that an additional 2% can be expected to begin leaking each year.

The paperwork requirements for UST's include notifying EPA, maintaining monitoring records, and submitting reports showing evidence of financial assurance. Existing facilities have submitted the notification form already, a one-time cost of about $15.[12] Because most owners/operators now keep inventory or other tank monitoring records, these requirements will not result in incremental costs. Filing a record of the required tank tightness test every three years will require approximately 5 minutes and cost about $1.25. The annual cost of showing evidence of financial assurance and maintaining records of financial assurance is estimated to be $31.25[13]

Records must also be kept for tanks that have been upgraded, repaired, or closed. Recordkeeping costs for dry cleaners will vary depending on the number, age, and materials of their existing tanks and whether any leaks have been discovered. In most cases also, filing records will be the only paperwork requirement. If extensive corrective action is required, the owner/operator will have to submit a number of reports, including corrective action plans, progress reports, and a completion notification.

Regulations with an Indirect Impact

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Regulations under the CWA and MPRSA on the ocean dumping of wastes and the incineration of hazardous wastes at sea will also have an impact on waste disposal practices. The list of regulations that fall into this category includes:

RCRA	Subtitle C Location Standards
	Subtitle D Criteria
	Liner and Leachate Collection
	Corrective Action at SWMUs
	Hazardous Waste Burning
	Land Ban - Dioxin and Spent Solvents
	Land Ban - California List
	Land Ban - First Thirds
	Land Ban - Soil and Debris
	Hazardous Waste Tank Standards
	Toxicity Characteristics
CERCLA	National Contingency Plan
	CERCLA Settlement Policy
CWA	Ocean Dumping

These regulations will affect dry cleaners directly only if they maintain a waste storage, disposal, or treatment facility on their property. The vast majority of dry cleaners have no need to maintain such facilities and contract out all of their waste disposal needs.

These regulations will affect dry cleaners indirectly, however, by making it more difficult and more expensive for them to dispose of their wastes. In July 1987, the EPA Office of Small Business Ombudsman reported on a survey of dry cleaners that indicates that hazardous waste regulations already are creating problems for the industry.[10] Major complaints centered on understanding the hazardous waste regulations and the high costs associated with disposal. The latter situation was attributed by the dry cleaners to a monopoly by Safety-Kleen which, the dry cleaners charged, has no competition and is free to raise rates and set terms for collection of wastes.

For the smallest dry cleaners with hazardous wastes, the minimum costs of removing these wastes were reported to be $40 per month. This is the cost charged by Safety-Kleen, who insists on monthly pick-up, needed or not. Costs were reported to have greatly escalated recently. Dry cleaners are protesting their lack of choice in transporters and the resulting pressures, especially financial, put upon them by Safety-Kleen. The judgement of the dry cleaners that Safety-Kleen's prices are unreasonably high was expressed by 79% of the respondents to the survey.

Regulations with an Uncertain Impact

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the SDWA. The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, certain activities, possibly including dry cleaning may be banned. This program will affect only those dry cleaners that are located near drinking water wells. The number of such firms and the potential impact upon their activities has not yet been determined.

IMPACT OF THE REGULATIONS

Businesses in the dry cleaning industry are among the smallest of the small. Most dry cleaners have fewer than five employees with average sales per employee that are less than half the national average. As shown in Table G-4, the median dry cleaner with fewer than 10 employees in 1983 had net profits of less than $10,000 and equity of less than $40,000. While their rate of return on equity was high, the profit available to absorb additional costs was low. Dry cleaners at the lower quartile level of this size category in 1983 had net profits of only $5,000 and equity of only $8,000.

Table G-5 presents a summary of the environmental costs for "typical" dry cleaners in each of the major regulated categories. Dry cleaners that do not require perc emission controls and have no underground storage tanks will face about $1,000 in additional annual costs plus about $4,280 in additional first-year expenses. These costs amount to about 11% of both the annual net profits and equity of the median dry cleaner with fewer than 10 employees. Dry cleaners at the lower quartile level of this size category will have to spent a larger portion of their resources in order to meet the regulations; approximately 20% and 54%, respectively, of net profits and equity. These figures suggest that most dry cleaners that do not have to install perc emission controls or meet UST standards will be able to afford the regulatory costs. A few of the most marginal firms in the smallest size category may have difficulty, however.

Should perc emission controls be required of the smallest dry cleaners, current estimates show they may have to invest $6,000 or more for the perc controls plus an additional $4,300 for SARA and RCRA and will face additional annual costs of up to $2,800 to meet all of the regulatory requirements. These costs amount to about 35% of the median annual net profits and about 33% of the median equity of dry cleaners with 1-9 employees. Dry cleaners at the lower quartile level of this smallest size category will have to spend about 60% of their annual net profits and over 150% of their equity. These figures suggest that some of the smallest dry cleaners may have difficulty installing perc emission controls in addition to meeting the other environmental requirements. The perc regulation is still under formulation with many options under study, however, so that actual costs for perc emission controls may be much different than preliminary estimates.

Dry cleaners with regulated underground storage tanks will have to invest approximately $7,300 to upgrade their tank and meet the additional first year costs and will face additional annual costs of approximately $3,700. These costs amount to about 40% and 19%, respectively, of the median annual net profits and equity of dry cleaners in the smallest size category. Dry cleaners at the lower quartile level of this size category will have to spend about 80% of their annual net profits and about 100% of their equity. These figures suggest that many of the smallest dry cleaners will have difficulty meeting UST standards and that some may close.

Dry cleaners with leaking underground storage tanks could face even higher costs as they complete the required corrective actions and repair or replace damaged tanks. These costs could exceed $100,000. Such costs would exceed the equity of the average dry cleaner even in the 10-19 employee size category. Many small dry cleaners do not have the resources to pay for such large corrective action costs.

Table G-4

FINANCIAL PROFILE - 1983

(median values in $1,000)

DRY CLEANING

(SIC 7216)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$112	$301	$549	$1,273	$2,124	$220
Expenses and Taxes	103	286	541	1,250	2,080	208
Net Profit	9	15	8	23	44	12
Assets	68	123	169	324	625	124
Equity	38	46	124	292	365	51
Return on Equity	25%	33%	6%	8%	12%	24%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Table G-5

REGULATORY COSTS FOR TYPICAL SMALL BUSINESSES
in the
THE DRY CLEANING INDUSTRY
(SIC 7216)

Firm #1: 5 employees, sales = $110,000/yr, net profit = $10,000/yr, equity = $40,000. One 30 lb. dry-to-dry Perc machine with controls.

Act/Regulation	One-Time Costs	Annual Costs
SARA: Title III	$ 600	$ 400
RCRA: Generators of 100-1,000 kg.	$3,680	$ 600
TOTAL COSTS	$4,280	$1,000

Firm #2: 5 employees, sales = $110,000/yr, net profit = $10,000/yr, equity = $40,000. One 35 lb. transfer Perc machine, no controls.

Act/Regulation	One-Time Costs	Annual Costs
CAA: Perc Dry Cleaners NESHAP	$6,760-$8,420	$680-$1,830
SARA: Title III	$ 600	$ 400
RCRA: Generators of 100-1,000 kg.	$3,680	$ 600
TOTAL COSTS	$11,040-$12,700	$1,680-$2,830

Firm #3: 5 employees, sales = $110,000/yr, net profit = $10,000/yr, equity = $40,000. One 30 lb. petroleum machine with underground storage tank.

Act/Regulation	One-Time Costs	Annual Costs
SARA: Title III	$ 600	$ 400
RCRA: Generators of 100-1,000 kg.	$3,680	$ 600
RCRA: UST Standards	$3,000	$2,665
TOTAL COSTS	$7,280	$3,665

CONCLUSION

The list of environmental regulations facing the dry cleaning industry suggests that the most expensive regulations will apply to selected dry cleaners; namely, perc dry cleaners that have no emission controls and petroleum dry cleaners with regulated underground storage tanks. Unfortunately, there are no industry surveys available to suggest how many dry cleaners fall into these two categories nor is the status of these two important regulations yet certain.

A comparison of the expected costs of environmental regulations with industry financial statistics, suggests that most dry cleaners who do not have to install perc emission controls or meet UST standards will be able to meet environmental requirements without difficulty. Installing perc emission controls or meeting UST standards may be difficult for many of the smallest dry cleaners, however, and some of them may be unable to remain in business. Many small dry cleaners that face extensive corrective action costs associated with leaking underground storage tanks are very likely to have insufficient resources to carry out the required cleanup.

Appendix H

PHOTOFINISHING LABORATORIES

Photofinishing laboratories develop film into finished prints by treating a silver halide sensitized material (film) with a series of chemical solutions and washes which produce a visible image in black-and-white or color. Typically, the processing laboratory is made up of several rooms, each for a different process step while the minilabs are essentially self-contained units which take up approximately 60 square feet of space. Most facilities process only color film and send black-and-white and slide film out to larger regional labs.

In 1986, there were 5,763 firms primarily engaged in the photofinishing industry (SIC 7384).[1] These firms employed 78,038 people and had total sales of approximately $5 billion ($67,000 per employee). Almost half (52 percent) of these firms had fewer than 5 employees and 90 percent had fewer than 20 employees. Only 79 firms had more than 100 employees. Firms with fewer than 20 employees accounted for 55 percent of industry sales and 33 percent of industry employment. (See Table H-1.)

The U.S. Small Business Administration (SBA) classifies as small businesses all firms in SIC 7384 with annual sales less than $3.5 million. In 1986, photofinishing laboratories with 50-99 employees had average sales of $3.4 million and laboratories with 100-249 employees had average sales of $7.4 million. Thus, most firms in SIC 7384 with fewer than 100 employees (98.6% of the industry) in 1984 were considered small businesses.

A typical small photofinishing laboratory has 5 employees and annual sales of approximately $300,000. Such a firm operates out of single urban location with one color processing machine.

ENVIRONMENTAL PROBLEMS

There are five major chemical processing steps that are generally used in processing color film or paper: developing, stopping development, bleaching, fixing and stabilizing. The developing solutions contain silver, a hazardous but also a valuable material. Some of the other solutions used in photofinishing processes, such as ferrocyanide bleach, are also hazardous. The silver and hazardous solutions are potential sources of environmental problems, if they are allowed to contaminate wastewaters or other wastes.

Table H-1

SMALL BUSINESSES IN THE PHOTOFINISHING INDUSTRY - 1986

(SIC 7384)

	Employees Per Firm				
	1-4	5-9	10-19	20-49	50-99
Number of Firms	3,004	1,538	660	359	124
Cumulative Share of:					
Firms	52%	79%	90%	96%	98%
Sales	15%	28%	55%	70%	78%
Employment	10%	23%	33%	47%	57%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), United States Establishment and Enterprise Microdata (USEEM).

Because silver is a valuable metal, photofinishers recycle and reclaim the silver so that they generate little or no silver containing wastes. Small photofinishers also avoid generating hazardous wastes by using nonhazardous bleaching solutions. Consequently, most small photofinishers have no substantial environmental problems.

Only the large laboratories (15%-18% percent of the industry) use ferrocyanide bleach. The wastewaters resulting from the bleaching process are treated prior to discharge, but the treatment process generates a cyanide sludge. This cyanide sludge is accumulated and shipped out for incineration.

ENVIRONMENTAL REGULATIONS

Although the photofinishers use materials that might create serious environmental problems, they generally treat their wastewaters and practice extensive recycling. The quantities of toxic chemicals and hazardous materials that they handle each month are not sufficient to bring them under Title III of SARA.* Consequently, most of the small businesses in this industry will not be directly affected by any of the environmental regulations covered in this study. Large photofinishers may be subject to RCRA regulations, if they generate sufficient hazardous wastes each month. Table H-2 summarizes the principal environmental regulations that will affect the photofinishing industry during the 1988-1992 period.

Paperwork requirements for small photofinishing laboratories appear will be negligable. Only the largest laboratories will be affected by the environmental regulations included in this study.

Regulations with a Direct Impact

RCRA: Generators of 100 to 1000 kg/mo

The Hazardous and Solid Waste Amendments of 1984 require EPA to regulate generators of hazardous wastes that produce between 100 and 1000 kilogram per month. The EPA requirements include obtaining an EPA identification number, maintaining a uniform manifest system, installing management controls, and meeting a limited set of performance standards. EPA's final rule was promulgated in March 1986 and became effective September 22, 1986.

Photofinishers typically generate four types of wastes that could bring them under these regulations as generators of 100-1000 kg/mo: silver-bearing fix solutions and wastewater, chemical recovery cartridges (CRCs) used to recover silver, film chips containing silver, and ferrocyanide sludge. As discussed most photofinishers reclaim their silver and generate little or no silver-bearing waste. Only the largest photofinishers produce ferrocyanide sludge.

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*Should the threshhold quantity of 10,000 lb. for Sections 311-312 be reduced, small photofinishers may be required to meet Title III requirements.

Table H-2

ENVIRONMENTAL REGULATIONS
for the
THE PHOTOFINISHING INDUSTRY
(SIC 7384)

Act/Regulation	Requirements	Cost to Small Business	Comments
Direct Impact			
RCRA: Generators of 100-1,000 kg/mo	manifest, proper handling	$3,680 first year, $1,560 per year thereafter	Will not affect small firms.
Indirect Impact			
RCRA: Hazardous Waste Regulations	higher waste disposal costs	undetermined	Small firms have no haz. waste.
Uncertain Impact			
SDWA: Wellhead Protection	activity bans near drinking water wells	undetermined	May apply to few firms, if any.

Those photofinishers that use CRCs to recover silver, send their CRCs to metal reclamation centers and receive about $132.00 for each one.[2] Currently, these CRCs are not classified as a hazardous waste. If they should be reclassified, only the largest photofinishers will produce 100 kg/mo. Such a facility would have to produce at least 60 CRCs a year. These would have a resale value of approximately $7,920.

EPA estimates that it will cost a small business approximately $3,680 to comply with the initial requirements of these regulations and approximately $1,560 per year thereafter.[3]

Regulations with an Indirect Impact

RCRA and CERCLA and CWA: Waste Disposal Regulations

Under CERCLA and RCRA and their subsequent amendments, EPA is issuing several regulations governing the transportation, storage, treatment, and disposal of hazardous and nonhazardous wastes as well as standards for corrective action for hazardous waste and toxic substance spills. Regulations under the CWA and MPRSA on the ocean dumping of wastes and the incineration of hazardous wastes at sea will also have an impact on waste disposal practices. The list of regulations that fall into this category includes:

RCRA	Subtitle C Location Standards
	Subtitle D Criteria
	Liner and Leachate Collection
	Corrective Action at SWMUs
	Hazardous Waste Burning
	Land Ban - Dioxin and Spent Solvents
	Land Ban - California List
	Land Ban - First Thirds
	Land Ban - Soil and Debris
	Hazardous Waste Tank Standards
	Toxicity Characteristics
CERCLA	National Contingency Plan
	CERCLA Settlement Policy
CWA	Ocean Dumping

These regulations will affect small photofinishing firms indirectly, however, by making it more difficult and more expensive for them to dispose of their wastes. Thus, the costs of their waste disposal can be expected to increase. As discussed above, small photofinishers generate very little hazardous wastes, if any, and should not be significantly affected by rising waste disposal costs. Large photofinishers that use ferrocyanide bleach may find the costs of incineration services increasing. Unfortunately, no estimates are available of the likely magnitude of such cost increases.

Regulations with an Uncertain Impact

SDWA: Wellhead Protection

In June 1986, the Wellhead Protection Act (WHP) was added as an amendment to the SWDA. The WHP is to be a voluntary program carried out by the individual states. The location of wellheads would be identified and activities and facilities within a certain area surrounding the wellhead would be examined for possible contaminants. Under the WHP, it is possible that certain photofinishing activities could be banned. This program will affect only those photofinishing firms that are located near drinking water wells. The number of such firms and the potential impact upon their activities has not yet been determined.

IMPACT OF THE REGULATIONS

The financial profile of the photofinishing industry in 1983 is presented in Table H-3. The smallest firms in the industry had sales in 1983 of about $200,000 with net profits of $5,000 and equity of about $35,000. The largest firms in the photofinishing industry, those with 50 or more employees, had annual sales of approximately $2 million and more and annual profits of $25,000 to several hundred thousand dollars. Their average equity was $500,000 or more.

Most photofinishers do not create sufficient environmental problems to be directly affected by any of the regulations covered in this study. Consequently, no adverse impacts are likely for the small business segment of the photofinishing industry. The large photofinishers may find that they are covered by EPA's hazardous waste regulations and, in rare cases, by Title III of SARA, but the added costs of these regulations should not exceed $1,000 per year. These figures suggest that photofinishing firms will have no difficulty meeting environmental requirements.

CONCLUSION

Small photofinishing laboratories will not be affected by any of the environmental regulations included in this study. Some of the larger photofinishers will have minor costs associated with handling hazardous wastes and toxic chemicals, but no adverse impacts are indicated. Of more concern to large photofinishers might be changes in the availability and/or costs of incineration services for their wastewater treatment sludges. There is no indication at this time, however, that the costs of such services might become unmanageable.

Table H-3

FINANCIAL PROFILE - 1983
(median values in $1,000)

PHOTOFINISHING
(SIC 7384)

	Number of Employees per Firm					
	1-9	10-19	20-49	50-99	100+	All Firms
Net Sales	$211	$527	$951	$1,921	$7,015	$379
Expenses and Taxes	206	511	936	1,897	6,655	371
Net Profit	5	16	15	24	360	8
Assets	115	201	461	936	2,954	188
Equity	35	92	194	480	1,761	79
Return on Equity	13%	17%	8%	5%	20%	11%

Source: U.S. Small Business Administration: Small Business Data Base (SBDB), Fin/Stat File.

Appendix I

WATER SUPPLY

A public water system is defined under the Safe Drinking Water Act (SDWA) as a system for providing water for human consumption serving 25 or more persons and having at least 15 service connections. The SDWA definition of a public water supply includes the collection, treatment, storage, and distribution facilities necessary for the provision of potable water.

Public water systems are grouped in three main categories: community water systems, non-community water systems, and non-transient non-community water supplies. Community water systems serve fixed or residential populations more than 60 days per year. Non-community systems generally serve transient populations at facilities such as campgrounds, marinas, restaurants, motels, hotels and highway rest areas with their own water supplies. Non-transient non-community water supplies typically serve fixed populations, such as factories, schools, day-care centers, and places of employment. Many of the regulations controlling contaminant levels in drinking water apply to community and non-transient non-community water systems because of the potential for chronic exposure. Of the approximately 200,000 public water systems in the United States, 52,350[*] (29%) currently are considered to be community water systems.

The public water supply industry consists of both publicly-owned and privately-owned water supplies. Publicly-owned water supplies are predominantly owned by local municipal governments, although a sizeable number are owned by the federal government. Privately-owned systems that serve large populations are usually investor-owned entities. Privately-owned systems that serve smaller populations tend to be owned by homeowners associations, mobile-home parks, or developers. Many small privately-owned systems that serve mobile home parks or other small developments are not set up as distinct entities in the conventional sense of a regulated utility. These systems (referred to as ancillary systems) usually do not have a separate rate to cover the costs of delivering water to the communities they serve. They are, nevertheless, within the purview of the SDWA definition of a public water supply.

Of the 59,000 community water systems in the United States, about 28,500 (54%) are privately-owned systems. The size differentiation of public water supplies is usually made on the basis of the size of the population served. Table I-1 shows the size distribution of both publicly-owned and privately-owned community water systems.

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[*] The Federal Reporting Data System counts 59,000 community water systems. These figures, collected from the states, show more small systems than do the survey data presented in Table I-1.

Table I-1

SMALL BUSINESSES IN THE WATER SUPPLY INDUSTRY - 1986

(SIC 4941)

System Size (Pop. Served)	Publicly Owned	Privately Owned			
		Investor	Home Assoc.	Ancill.	Total
Very Small (25-500)	6,900	4,600	5,100	13,000	22,700
Small (501-3300)	9,600	2,100	1,500	900	4,500
Medium (3301-10000)	3,900	600	300	5	905
Large (10K-100K)	3,100	300	50	5	355
Very Large (>100K)	310	65	15	0	80
Total	23,810	7,665	6,965	13,910	28,540
Small Businesses (<50K; $3.5 M)	NA	7,600	6,900	13,900	28,400

Source: U.S. Environmental Protection Agency, Office of Drinking Water; 1986 Survey of Community Water Systems.

Also shown in Table I-1 is the number of systems that meet the U.S. Small Business Administration standards of a small business. According to that standard, a privately-owned water supply would qualify as a small business if its average annual revenues for the previous three years do not exceed $3.5 million. Based on the revenue data provided in the 1986 Survey of Community Water Systems, privately-owned systems serving up to 50,000 people have annual revenues below $3.5 million. Using this standard, 28,400 (more than 99.5 percent) privately-owned public water systems can be considered small businesses. These include both those that charge for water and those (i.e., the ancillary systems) that do not.

The equipment and processes of public waters systems have four basic components: 1) source and transmission facilities such as well sites and surface impoundments; 2) treatment facilities such as filtration and disinfection equipment; 3) storage facilities such as elevated storage tanks; and 4) distribution systems such as valves, hydrants and piping materials. The amount and type of equipment, particularly for treatment facilities, varies according to the system size, water source and water characteristics requiring treatment.

According to the 1986 Survey of Community Water Systems, these systems generally have between one and seven operators working between 2 and 34 hours per week. Typically, the very small systems have only part-time operators, usually non-professionals. As would be expected, the larger systems have operators (most of whom are professionally trained) who typically are full-time employees.

Revenue data for the water supplies that are small businesses (limited to those who charge for water) indicate that annual revenues range from $32 thousand for the smallest systems up to approximately $3.5 million for the larger ones. Total net assets range from approximately $430 thousand to $34.4 million.

ENVIRONMENTAL PROBLEMS

Unlike the other industries included in this study, the water supply industry does not contribute to environmental problems. Instead, the industry works to correct existing problems by removing contaminants from the water supplied to its users. The principal environmental regulations that affect the industry are those that establish maximum contaminant levels for the water that these systems supply to consumers. In this sense, the regulations are similar to product standards rather than pollution control standards.

ENVIRONMENTAL REGULATIONS

Public water systems are regulated under the 1974 Safe Drinking Water Act (SDWA) and the 1986 Amendments to the Act. Under the 1986 Amendments, EPA is required to promulgate National Primary Drinking Water Regulations (NPDWRs) for 83 specific contaminants. Regulations for these 83 contaminants, as well as other regulations discussed below, must be adopted on a very stringent schedule -- by June 19, 1989. In addition to the tight EPA regulatory schedule, NPDWRs must officially take effect at the state level within 18 months of promulgation.

The NPDWRs establish non-enforceable Maximum Contaminant Levels (MCLGs) at which no known or anticipated adverse health effects occur, allowing for an adequate margin of safety. Enforceable Maximum Contaminant Levels (MCLs) are set as close to the MCLGs as is feasible taking costs into account. In those cases where it is not economically or technically feasible to establish or enforce an MCL, the regulator may specify treatment techniques to be implmented by the water supplies.

Three other provisions of the SDWA are likely to have significant impacts on the drinking water industry. EPA is required to specify conditions under which public water systems served by surface water sources are required to install filtration as a treatment technique. EPA is also required to promulgate NPDWRs for disinfection as a treatment technique for all public water systems. Further, the SDWA mandates EPA to publish regulations which require public water systems to monitor for a number of "unregulated" contaminants at least once every five years. To help small systems comply with the disinfection requirement and the "unregulated" contaminants monitoring requirement, the SDWA authorizes funds for the EPA and states to provide assistance to small systems. No funds have been appropriated to fulfill this purpose.

Generally, the regulations promulgated under the SDWA apply only to community and non-transient non-community water supplies, although some (notably the microbiological and nitrate standards) apply to all water supplies.

Table I-2 summarizes the requirements of the principal environmental regulations that will apply to water supply systems. Ten of these establish the MCLs as well as monitoring and reporting requirements for the 83 contaminants specified in the 1986 SDWA Amendments. In addition, the surface water treatment rule includes critera under which the filtration of surface water will be required. The lead materials ban will prohibit the use of lead solder, flux, and pipes in new drinking water plumbing installations and repairs of public water systems and drinking water plumbing connected to such systems. The public notification rule includes changes to the regulations that require that the public be notified of contaminants in their drinking water or when a system violates the secondary standards for flouride.

As indicated in Table I-2, most of the regulations that establish MCLs will affect only a small percentage of the water supply systems. This is because the water from most systems already meets the standards that will be established. Most frequently, it will be the small water supply systems that will not meet the required MCLs. Thus, although the drinking water regulations will apply to all public water supply systems, it is the smaller systems that most often will incur additional costs in order to meet the required MCLs. Table I-3 presents EPA's estimates of the regulatory costs of the ten MCL regulations to water supply companies by size category.

All water systems regulated under the SDWA must perform a number of information collection activities to ensure compliance with primary regulations and proper operation and maintenance of water systems. Paperwork requirements include reporting and recordkeeping of compliance monitoring results and notifying the public if a standard is violated. The estimated average cost per facility of monitoring, recordkeeping, and reporting for the regulations varies from $6 for the fluoride regulation to approximately $5,000 for the surface water treatment rule for unfiltered plants.

Table I-2

ENVIRONMENTAL REGULATIONS
for the
THE PRIVATE WATER SUPPLY INDUSTRY
(SIC 4941)

Regulation	Requirements	Percent of Systems*
Public Notification Rule	Notification	100%
Lead Ban	Ban lead in plumbing, notification	100%
Total Coliform Rule	MCL, monitoring, reporting	90%
Corrosion Control Lead and Copper	Monitoring, corrosion control, public education	58%
Radionuclides	MCLs, monitoring, reporting	29%
Disinfection	MCLs, monitoring, reporting	24%
Surface Water Treatment Rule	MCLs, filtration, disinfection, monitoring, reporting	7%
Synthetic Organic Compounds (SOCs)	MCLs, monitoring, reporting	3%
Volatile Organic Compounds (VOCs)	MCLs, monitoring, reporting	2%
Lead and Copper MCL	MCLs, monitoring, reporting	1%
Fluoride	MCL, monitoring, reporting	.6%
Inorganic Chemicals (IOCs)	MCLs, monitoring, reporting	.4%
34 MCLs	MCLs, monitoring, reporting	<1%

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* Estimated percent of systems that will have to install additional treatment or incur other expenses to comply with the regulation.

Table I-3

PRIVATE WATER SUPPLY INDUSTRY
(SIC 4941)
REVENUES, ASSETS, AND REGULATORY COSTS
($1,000)

	--- Population Served ---						
Regulation/Activity	25-100	100-500	500-1,000	1,000-3,300	3,300-10,000	10,000-25,000	25,000-50,000
Number of Community Systems[1]	16,779	10,763	2,159	2,063	783	203	114
Net Assets (Median)[2]	25	58	236	824	3,835	2,426	33,480
Annual Revenues (Median)[2]	4	16	48	169	504	1,101	2,257
COLIFORM							
Percent of Systems[3]	95%	98%	100%	97%	23%	2%	5%
Capital Cost[4]	-	-	-	-	-	-	-
Annualized Cost[5]	<1	<1	1	1	<1	1	<1
CORROSION CONTROL							
Percent of Systems	54%	53%	55%	47%	49%	47%	47%
Capital Cost	3	4	6	9	55	71	315
Annualized Cost	2	2	4	6	19	37	49
DISINFECTION							
Percent of Systems	28%	21%	16%	9%	6%	4%	3%
Capital Cost	9	17	27	42	76	136	200
Annualized Cost	3	4	9	15	20	39	49
RADIONUCLIDES							
Percent of Systems	30%	29%	20%	16%	14%	11%	10%
Capital Cost	66	76	92	155	186	375	657
Annualized Cost	5	6	8	14	25	56	100
SWTR - FILTERED							
Percent of Systems	3%	3%	9%	10%	24%	29%	39%
Capital Cost	10	15	19	23	59	79	100
Annualized Cost	5	5	11	15	18	22	28
SWTR - UNFILTERED							
Percent of Systems	2%	2%	3%	3%	4%	3%	4%
Capital Cost	90	164	291	498	1,401	2,371	3,558
Annualized Cost	14	22	44	74	127	357	538
SOCs							
Percent of Systems	3%	3%	3%	3%	3%	2%	1%
Capital Cost	51	68	98	171	999	1,580	3,500
Annualized Cost	12	16	24	44	217	354	730
VOCs							
Percent of Systems	2%	2%	2%	2%	2%	2%	3%
Capital Cost	24	36	59	90	178	386	670
Annualized Cost	3	5	9	16	24	58	100
LEAD & COPPER MCL							
Percent of Systems	1%	1%	1%	1%	1%	1%	1%
Capital Cost	149	231	276	495	1,674	1,715	2,550
Annualized Cost	18	34	45	83	219	230	470
IOCs							
Percent of Systems	<1%	<1%	<1%	<1%	1%	<1%	1%
Capital Cost	203	280	308	553	978	1,830	1,200
Annualized Cost	26	33	55	135	158	350	80
FLUORIDE							
Percent of Systems	<1%	<1%	<1%	<1%	<1%	0%	0%
Capital Cost	7	6	85	80	1,210	-	-
Annualized Cost	4	4	19	53	195	-	-

Source: U.S. Environmental Protection Agency, Office of Drinking Water.

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[1] Source: Federal Reporting Data System (FY86 & FY87)

[2] Source: U.S. Environmental Protection Agency, Office of Drinking Water; Final Descriptive Summary: 1986 Survey of Community Water Systems; Washington, D.C.; October 23, 1987.

[3] Percent of systems in the size category that will have to make additional expenditures to comply with the regulation.

[4] Average estimated capital cost for systems that must make additional expenditures.

[5] Average estimated annualized costs (operating and maintenance costs plus a capital recovery factor) for systems that must make additional expenditures.

IMPACT OF THE REGULATIONS

The new requirements under the SDWA will significantly affect the private water supply industry because of the accelerated implementation schedule for NPDWRs and the costs for systems to comply with the requirements. Although the new requirements will be expensive, compliance costs will be ultimately borne by customers. Due to often inadequate rate bases, small systems and their customers face the greatest difficulty in financing the necessary compliance activities.

Systems will have to monitor their water for a greater number of contaminants than is currently required and install appropriate treatment equipment if contaminants exist at unsafe levels. Some small systems will likely have a significant number of violations until adequate treatment is in place; therefore, public notification of violations will be an additional expense. Due to often inadequate rate bases, small systems and their customers will face the greatest difficulty in financing the necessary compliance activities.

The greatest impact will be felt by the very small systems with water that fails to meet one or more of the MCLs. As shown in Table I-3, the annual costs of the most expensive treatment processes, e.g. for IOCs, can be several times the current average revenues of the smallest water supply systems. Very small water supply systems with contaminated water will have to increase their rates substantially or find alternative solutions to their problems. Fortunately, only a small percentage of water supply systems, in most cases fewer than 1%, will face these difficulties.

Recognizing that small systems may be limited in their ability to comply with the new regulations, EPA is attempting to minimize the economic impact on small systems where possible without reducing the protection of public health. The SDWA provides an exemption procedure[*] that allows water supplies additional time to meet the new standards, provided that the water being delivered in the interim does not present an unreasonable risk to health. It is expected that the exemptions will be used primarily to assist small supplies in achieving compliance.

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[*] Water supplies serving fewer than 500 service connections, or approximately 1,500 people, are eligible for extendible two-year exemptions. These exemptions are to be based upon the need for "financial assistance for the necessary improvements," but cannot be granted if there is an unreasonable risk to health.

Appendix J

ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

	Program/Short Title	Legislative Title	Promulgation
	Air		
1.	Rural Fugitive Dust	CAA Section 110, 165, 169 / Agricultural Burning	undetermined
2.	Stratospheric Ozone	Stratospheric Ozone Protection Strategy	8/88
3.	Municipal Waste Combustors	NSPS: Municipal Waste Combustors (Assessment of Municipal Waste Combustor Emissions Under the Clean Air Act)	12/90
4.	TSDF Air Standards	Treatment, Storage, and Disposal Facility Area Source Air Emissions - RCRA Standards	9/90
5.	Diesel Fuel Standards	Diesel Fuel Modification	7/89
6.	Diesel Particulate Standards	Nonconformance Penalties for 1991 through 1994 Model Year Emission Standards for Heavy-Duty Vehicles and Engines	3/89
7.	Fuel Volatility	Control of Excess Evaporative Emissions/ Fuel Volatility	1/89
8.	Gas Marketing	Decision on Air Pollution Regulatory Strategies for the Gasoline Marketing Industry	1/89
9.	Lead Phasedown	Removal of Lead from EPA Certification and Test Fuels (Revision)	1/88
10.	NAAQS: Lead	NAAQS: Lead	3/90
11.	NAAQS: Particulate Matter	NAAQS for Particulate Matter (Revision)	undetermined
12.	NESHAP: Chromium	NESHAP: Chromium--Electroplating	3/91
13.	NESHAP: Perc Dry Cleaning	NESHAP: Perchloroethylene Dry Cleaning	undetermined
14.	NSPS: Small Boilers	NSPS: Small Boilers	9/90
15.	NSPS: Industrial Boilers	NSPS: Industrial Boilers	12/87
16.	NSPS: Woodstove	NSPS: Residential Wood Combustion	2/88

Appendix J (cont.)

ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

	Program/Short Title	Legislative Title	Promulgation
	Radiation		
17.	Radon		undetermined
18.	Radiofrequency Guidance	Federal Radiation Protection Guidance: Proposed Alternatives for Controlling Public Exposure to Radiofrequency Radiation	7/89
19.	Low Level Radioactive Waste	Environmental Protection Standards for Low-Level Radioactive Waste	5/89
20.	High Level Radioactive Wastes	Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes	undetermined
	Pesticides		
21.	Inerts		undetermined
22.	Farmworkers	Worker Protection Standards for Agricultural Pesticides (Revision)	3/89
23.	Pesticides in Groundwater		2/89
24.	Large Volume Pesticides		undetermined
25.	Data Requirements	Comprehensive Revision of Pesticide Registration and Classification Procedures (Revision)	5/88
26.	Reregistration of Pesticides		undetermined

Appendix J (cont.)

ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

	Program/Short Title	Legislative Title	Promulgation
	Toxic Substances		
27.	Asbestos Ban and Phasedown	Action Concerning Commercial and Industrial Use of Asbestos	1/89
28.	Asbestos in Schools	Asbestos Reinspection Rule	10/87
29.	Chlorinated Solvents	Regulatory Investigation of Chlorinated Solvents	6/89
30.	PCBs: Electrical Equipment	Polychlorinated Biphenyls/Manufacturing, Processing, Distribution in Commerce and Use Prohibitions: Use in Electrical Equipment	9/88
31.	PCBs: Electrical Transformers	Polychlorinated Biphenyls in Electrical Transformers: Final Rule	7/88
32.	Premanufacture Review Program		undetermined
	SARA		
33.	Title III of SARA	Emergency and Hazardous Chemical Inventory Forms and Community Right-To-Know Reporting Requirements, and	9/89
		SARA Section 313 Toxic Chemical Release Reporting Rule	6/89
	RCRA		
34.	Subtitle C Location Standards	Location Standards for Hazardous Waste Facilities	12/88
35.	Subtitle D Criteria	Solid Waste Disposal Facility Criteria	12/88
36.	Liner and Leachate Collection	Double Liner and Leachate Collection Systems for Hazardous Waste Land Disposal Units	9/88
37.	Corrective Action at SWMUs	Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities	11/88
38.	Hazardous Waste Burning	Burning of Hazardous Waste in Boilers and Industrial Furnaces	10/88

Appendix J (cont.)

ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

	Program/Short Title	Legislative Title	Promulgation
	RCRA (cont.)		
39.	Municipal Ash	Municipal Waste Combustor Ash Management	12/89
40.	Land Ban - First Thirds	Land Disposal Restrictions for First Third of Scheduled Wastes	8/88
41.	Land Ban - Soil and Debris	Land Disposal Restrictions for Soil and Debris Containing Hazardous Wastes	10/91
42.	Land Ban - Dioxin	Restrictions on Land Disposal of Specified Solvent Dioxin Wastes	undetermined
43.	Land Ban - Cal. List	Land Disposal Restrictions for Certain Hazardous Wastes - California List	7/87
44.	UST Financial Responsibility	Underground Storage Tanks Containing Petroleum - Financial Responsibility Requirements	5/88
45.	UST Technical Standards	Underground Storage Tanks - Technical Requirements / Technical Standards and Corrective Action Requirements for Design & Operation of USTs Containing Petroleum and Hazardous Substances	5/88
46.	Hazardous Waste Tank Standards	Hazardous Waste Tank Standards	undetermined
47.	Toxicity Characteristics	Identification of Hazardous Wastes by Toxicity Characteristics and Listing of Additional Organic Toxicants	8/88
48.	Small Quantity Generator	RCRA Small Quantity Generator Rule	3/86
49.	Waste Oil Management	Management of Used Oil	undetermined
	CERCLA		
50.	National Contingency Plan	National Oil and Hazardous Substances Pollution Contingency Plan (NCP)	11/89
51.	CERCLA Settlement Policy		undetermined

Appendix J (cont.)

ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

	Program/Short Title	Legislative Title	Promulgation
	Drinking Water		
52.	Total Coliform Rule	National Primary Drinking Water Regulations (NPDWR): Microbials and Filtration of Surface Drinking Water Supplies	undetermined
53.	Surface Water Treatment - Filtration		undetermined
54.	VOCs in Drinking Water	NPDWR: MCLs for Volatile Organic Chemicals Found in Drinking Water	6/87
55.	SOCs in Drinking Water		undetermined
56.	Inorganics in Drinking Water	NPDWR: Inorganic and Organic Compounds	undetermined
57.	Fluoride in Drinking Water		undetermined
58.	Lead MCL and Corrosion Control		undetermined
59.	Lead Ban	Public Water System Supervision Program: Ban on Lead in Plumbing	6/86
60.	34 MCLs		undetermined
61.	Radionuclides	NPDWR: Radionuclides	undetermined
62.	Disinfection	NPDWR: Disinfection, Disinfectants and Disinfection By-Products (Revision)	undetermined
63.	Public Notification Rule		10/87

Appendix J (cont.)

ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

	Program/Short Title	Legislative Title	Promulgation
	Groundwater		
64.	Well-head Protection		12/87
65.	Class I Underground Injection Wells	Underground Injection Control Program / Hazardous Waste Disposal Injection Restriction for Class I Hazardous Waste Injection Wells	undetermined
66.	Class II Underground Injection Wells		undetermined
67.	Class V Underground Injection Wells		undetermined
	Surface Water		
68.	Construction Grants Program	Comprehensive Construction Grant Regulation Revision	5/89
69.	Secondary Treatment Waivers	CWA Section 301(h) Revisions	undetermined
70.	Municipal Sewage Sludge	Sewage Sludge Use and Disposal Regulations	12/89
71.	State Sludge Management	National Pollutant Discharge Elimination System Sewage Sludge Permit Regulations; State Sludge Management Program Requirements	2/89
72.	Pretreatment	Final Revisions to General Pretreatment Regulations for Existing and New Sources	undetermined
73.	Stormwater	NPDES Regulations: Stormwater Application Requirements (Revision)	11/89
74.	Nonpoint Sources	Section 319 of the Clean Water Act / Nonpoint Source Guidance	undetermined
75.	Wetlands	404(c) Regulations / Actions	undetermined
76.	National Estuary Program		undetermined

Appendix J (cont.)

ENVIRONMENTAL REGULATIONS INCLUDED IN THE STUDY

	Program/Short Title	Legislative Title	Promulgation
	Surface Water (cont.)		
77.	Toxic Water Pollutants	Section 304(l) of the Clean Water Act Regulations	
78.	Ocean Dumping	Comprehensive Revisions to Ocean Dumping Regulations	8/89
79.	ELG: Foundries	Metal Molding and Casting Industry Point Source Category Effluent Limitations Guidelines, Pretreatment Standards and Nonpoint Source Performance Standards	10/85
80.	ELG: Placer Gold Mining	Effluent Limitations Guidelines for the Placer Gold Mining Industry	undetermined
81.	ELG: Machinery Manufacturing and Rebuilding	Effluent Limitations Guidelines for the Equipment Manufacturing and Rebuilding Industry	undetermined
82.	ELG: Oil and Gas	Effluent Guidelines for Offshore Oil and Gas Extraction Industry (Revision)	3/90
83.	ELG: Organic Chemicals	Effluent Guidelines for Organic Chemicals and Plastics and Synthetic Fibers	12/87
84.	ELG: Pesticides	Effluent Guidelines for Pesticides Chemicals	9/91
85.	ELG: Pulp and Paper	Effluent Guidelines for Pulp, Paper and Paperboard	5/88

NOTES

Appendix A

1. ICF, Incorporated, " Analysis of the Combined Impact of Various EPA Regulatory Initiatives on Generators of 100 - 1000 kg/mo.", prepared for the U.S. Environmental Protection Agency, January 1986- DRAFT.

2. ICF Incorporated, "Report to Congress on Small Quantity Generators of Hazardous Waste," Volume I, July 1986.

3. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This estimate assumes that the average time per facility to read the instructions, find out the identification number of the hazardous waste, and complete the notification form is 1.5 hours.

4. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This estimate assumes that the average electroplater will send out two shipments of hazardous waste each year. Each shipment will require about 1.5 hours of a supervisor's time and one half hour of clerical time. Recordkeeping will require about five minutes of clerical time.

5. ICF Incorporated, "Regulatory Impact Analysis of the Land Disposal Restrictions of First Third Wastes," prepared for Office of Solid Waste, U.S. Environmental Protection Agency, Washington, D.C., August 1988, Exhibit 3-9, first page. Estimate is derived by dividing the incremental cost of managing F006 wastes ($64,409,000) by the quantity requiring treatment (134,580,800 gallons per year).

6. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. These cost estimates are based on an hourly rate of $35 for manager/supervisor time.

7. Regulatory Impact Analysis in Support of Final Rulemaking Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986. September 1987.

8. Regulatory Impact Analysis in Support of Proposed Rulemaking Under Section 313 of the Superfund Amendments and Reauthorization Act of 1986, May 1987.

Appendix B

1. Micklewright, James T., "Wood Preservation Statistics, 1985: A Report to the Wood Preserving Industry in the United States.", January 1987.

2. U.S. Environmental Protection Agency, Office of Water Planning and Standards, "Economic Impact Analysis of Alternative Pollution Control Technologies".

3. Micklewright, James T., Op. cit.

4. Micklewright, James T., Op. cit.

5. Micklewright, James T., Op. cit.

6. Ebner, Volz and Selman, "Wood Preservers Guide to RCRA", February 1986.

7. Industrial Economics, Inc., "Regulatory Analysis of Restrictions on Land Disposal of Certain Dioxin-Containing Wastes", prepared for the U.S. Environmental Agency, November 1986, pp. 1-4.

8. Hazardous Waste Report, Aspen Publishers, Inc. Vol. 8 #14, March 16, 1987.

9. ICF Incorporated, "Report to Congress on Small Quantity Generators of Hazardous Waste," Volume I, July 1986.

10. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This estimate assumes that the average time per facility to read the instructions, find out the identification number of the hazardous waste, and complete the notification form is 1.5 hours.

11. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This estimate assumes that the average wood preserver will send out two shipments of hazardous waste each year. Each shipment will require about 1.5 hours of a supervisor's time ($35.50/hr.) and one half hour of clerical time ($6.25/hr.). Recordkeeping will require about five minutes of clerical time.

12. ICF Incorporated, "Regulatory Impact Analysis of the Land Disposal Restrictions of First Third Wastes", prepared for Office of Solid Waste, U.S. Environmental Protection Agency, Washington, D.C., August 1988, Exhibit 3-9, second page. Estimate of the post-regulatory cots is derived by dividing the post-reg cost of managing K001 wastes ($9,749,000) by the quantity requiring treatment (1,946,100 gallons per year). Estimate of the pre-regulatory cost is derived by subtracting from this figure the incremental cost ($8,755,000) divided by the quantity requiring treatment.

13. Industrial Economics, Inc., "Regulatory Analysis of Restrictions on Land Disposal of Certain Dioxin-Containing Wastes", prepared for the U.S. Environmental Agency, November 1986, p 6-3.

14. DPRA, Inc. "Preliminary Cost and Economic Impact Analysis of Listing Hazardous Wastes Under RCRA for the Wood Preserving and Sawmilling Industries," prepared for the U.S. Environmental Protection Agency, April 1987.

15. Ebner, Volz and Selman, Op. cit.

16. Gilbert, Walter, Telephone conversation, January 1988.

17. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch.

18. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. These cost estimates are based on an hourly rate of $35 for manager/supervisor time.

19. "Regulatory Impact Analysis in Support of Final Rulemaking Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986", September 1987.

20. John Hall, AWPI, Interview, January 1988.

21. "Regulatory Impact Analysis in Support of Proposed Rulemaking Under Section 313 of the Superfund Amendments and Reauthorization Act of 1986", May 1986.

22. John Hall, Op. cit.

Appendix C

1. ICF, "Analysis of the Combined Impact of Various Regulatory Initiatives on Generators of 100-1000 kg/mo," Jan. 6, 1986.

2. Meta Systems, Inc., "Economic Impact Analysis of Effluent Limitation Guidelines and Standards for the Pesticide Chemicals Industry," Sept. 1985.

3. ICF Incorporated, "Report to Congress on Small Quantity Generators of Hazardous Waste," Volume I, July 1986.

4. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This estimate assumes that the average time per facility to read the instructions, find out the identification number of the hazardous waste, and complete the notification form is 1.5 hours.

5. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This estimate assumes that the average wood preserver will send out two shipments of hazardous waste each year. Each shipment will require about 1.5 hours of a supervisor's ($35.50/hr.) time and one half hour of clerical time ($6.25/hr.). Recordkeeping will require about five minutes of clerical time.

6. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch.

7. "Regulatory Impact Analysis in Support of Final Rulemaking Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986", September 1987.

8. "Regulatory Impact Analysis in Support of Proposed Rulemaking Under Section 313 of the Superfund Amendments and Reauthorization Act of 1986", May 1986.

9. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch.

10. Ibid.

11. U.S. Environmental Protection Aency, Draft "Regulatory Impact Analysis: Worker Protection Standards for Agricultural Pesticides," Dec. 8, 1987.

12. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch.

13. ICF Inc., "Regulatory Impact Analysis for New Chemical Reporting Alternatives Under Section 5 of TSCA." Prepared for the Economics and Technology Division, U.S. Environmental Protection Agency, May 1983.

Appendix D

1. Telephone interviews with Agricultural County Agents in rural counties in Georgia, Iowa, and California, Jan. 1988.

2. Telephone interviews with farm store owners in Georgia and Iowa, Jan. 1988.

3. Miller Publishing Co., "Farmstore Merchandising 1986 Market Profile Study," Minnetonka, Minnesota.

4. Telephone interviews with Agricultural County Agents and farm store owners in rural counties in Georgia, Iowa, and California, Jan. 1988.

5. ICF, "Analysis of the Combined Impact of Various EPA Regulatory Initiatives on generators of 100-1000 kg/mo," Jan. 6, 1986.

6. Telephone interviews with Agricultural County Agents in rural counties in Georgia, Iowa, and California, Jan. 1988.

7. U.S. Environmental Protection Agency, "Draft Regulatory Impact Analysis: Worker Protection Standards for Agricultural Pesticides", Dec. 8, 1987.

8. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch.

9. Ibid.

10. "Regulatory Impact Analysis in Support of Final Rulemaking Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986", September 1987.

11. See note 8.

12. Meridian Research, Inc.

13. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This is assuming an hourly rate of $15/hr. for supervisor/manager time.

14. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. Owners/operators will need to spend 2 hours per response to submit reports showing evidence of financial assurance and an additional 5 minutes/year to maintain records of financial assurance or records to support an application for suspension of enforcement. Owners/operators who apply for suspension will group together by state, thus forming 50 associations that will submit twice-yearly applications for suspension of enforcement. According to EPA, the total number of owners/operators applying for suspension will be 272,089. At a total estimated cost of $180,000, the average cost per farm supply store is $0.66.

15. ICF Incorporated, "Report to Congress on Small Quantity Generators of Hazardous Waste," Volume I, July 1986.

Appendix E

1. Bob Lundy, Analyst, Office of Transportation Analysis, Interstate Commerce Commission, personal communication, Frbruary 8, 1988.

2. Tom Mcclellan, Analyst, Office of Transportation Analysis, Interstate Commerce Commission, personal communication, February 8, 1988.

3. "Regulatory Impact Analysis in Support of Final Rulemaking Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986", September 1987.

4. Meridian Research, Inc., "Regulatory Impact Analysis of Proposed Financial Responsibility Requirements for Underground Storage Tanks Containing Petroleum," prepared for Office of Underground Storage Tanks, Environmental Protection Agency, March 30, 1987.

5. Ibid.

6. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This is assuming an hourly rate of $15/hr. for supervisor/manager time for this industry.

7. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. Owners/operators will need to spend 2 hours per response to submit reports showing evidence of financial assurance and an additional 5 minutes/year to maintain records of financial assurance or records to support an application for suspension of enforcement. Owners/ operators who apply for suspension will group together by state, thus forming 50 associations that will submit twice-yearly applications for suspension of enforcement. According to EPA, the total number of owners/operators applying for suspension will be 272,089. At a total estimated cost of $180,000, the average cost per gasoline service station is $0.66.

8. See Note 6.

9. U.S. Environmental Protection Agency, "Evaluation of Air pollution Regulatory Strategies for Gasoline Marketing Industry," office of Air and Radiation, 84-012a, July 1984.

10. U.S. Environmental Protection Agency, "Draft Regulatory Impact Analysis: Refueling Emission Regulations for Gasoline-Fueled Motor Vehicles - Volume Analysis of Gasoline Marketing Regulatory Strategies," Office of Air and Radiation, EPA-450/3-87-001a, July 1987.

Appendix F

1. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This is assuming an hourly rate of $15/hr. for supervisor/manager time for this industry.

2. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. Owners/operators will need to spend 2 hours per response to submit reports showing evidence of financial assurance and an additional 5 minutes/year to maintain records of financial assurance or records to support an application for suspension of enforcement. Owners/ operators who apply for suspension will group together by state, thus forming 50 associations that will submit twice-yearly applications for suspension of enforcement. According to EPA, the total number of owners/operators applying for suspension will be 272,089. At a total estimated cost of $180,000, the average cost per gasoline service station is $0.66.

3. See Note 1.

4. ICF Incorporated, "Report to Congress on Small Quantity Generators of Hazardous Waste," Volume I, July 1986.

5. Conversation with Safety Kleen representative, April, 1988.

6. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This estimate assumes that the average time per facility to read the instructions, find out the identification number of the hazardous waste, and complete the notification form is 1.5 hours.

7. Ibid. Includes only recordkeeping costs associated with signing and filing the manifest.

8. "Regulatory Impact Analysis in Support of Final Rulemaking Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986", September 1987.

Appendix G

1. French, Michael T.; McNeilly, Lisa D.; "Economic Impact Analysis for the Dry Cleaning NESHAP," July 30, 1987.

2. Meijer, John, International Fabricare Institute, January 1988.

3. ICF, "Analysis of the Combined Impact of Various EPA Regulatory Initiatives on Generators of 100-1000 kg/mo.," January 6, 1986.

4. ICF, "Options for Regulating Perchloroethylene Emissions in the Dry Cleaning Industry: A Cost-Benefit Analysis," Nov. 11, 1987.

5. Radian Corp., letter from Ed Moretti to E.H. Pechan and Associates, Jan. 25, 1988.

6. Ibid.

7. ICF Incorporated, "Report to Congress on Small Quantity Generators of Hazardous Waste," Volume I, July 1986.

8. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. This is assuming an hourly rate of $15/hr. for supervisor/manager time.

9. Ibid. Includes only recordkeeping costs associated with signing and filing the manifest.

10. "Regulatory Impact Analysis in Support of Final Rulemaking Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986", September 1987.

11. Meridian Research, Inc.

12. See Note 8.

13. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Information Policy Branch. Owners/operators will need to spend 2 hours per response to submit reports showing evidence of financial assurance and an additional 5 minutes/year to maintain records of financial assurance or records to support an application for suspension of enforcement. Owners/operators who apply for suspension will group together by state, thus forming 50 associations that will submit twice-yearly applications for suspension of enforcement. According to EPA, the total number of owners/operators

applying for suspension will be 272,089. At a total estimated cost of $180,000, the average cost per gasoline service station is $0.66.

14. Lord II, G. F. "Hazardous Waste Pickup Problems among Automotive Maintenance and Dry Cleaning Firms," July 1987.

Appendix H

1. In 1984 Photofinishing Laboratories were classified as SIC 7395. This has since been changed to SIC 7384.

2. ICF, Incorporated, "Analysis of the Combined Impact of Various EPA Regulatory Initiatives on Generators of 100 - 1000 kg/mo.", prepared for the EPA, January 6, 1986.

3. ICF Incorporated, "Report to Congress on Small Quantity Generators of Hazardous Waste," Volume I, July 1986.